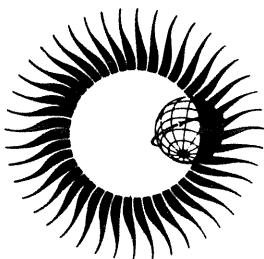


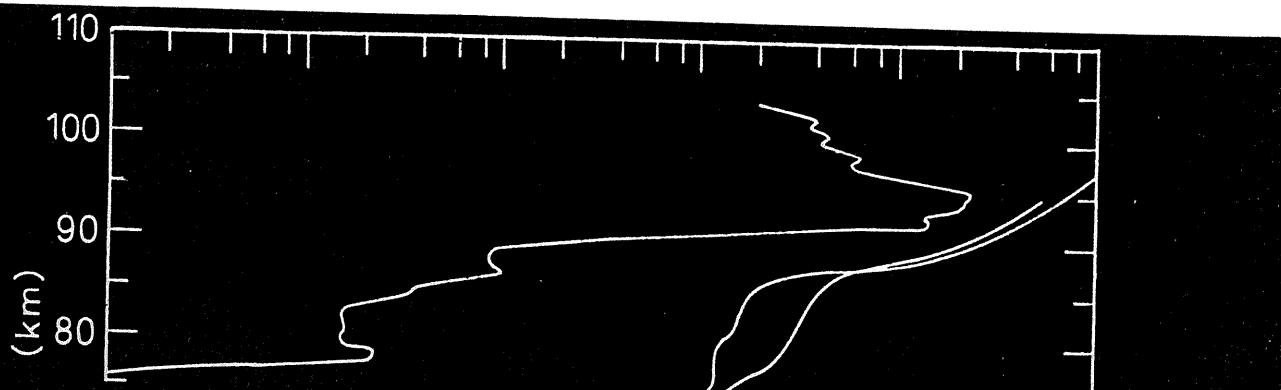
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REPORT UAG-82

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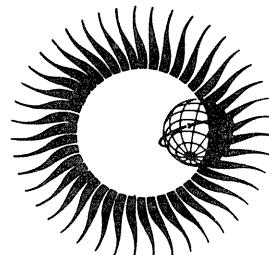
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task group on International Reference Ionosphere)**

Chairman: K. Rawer

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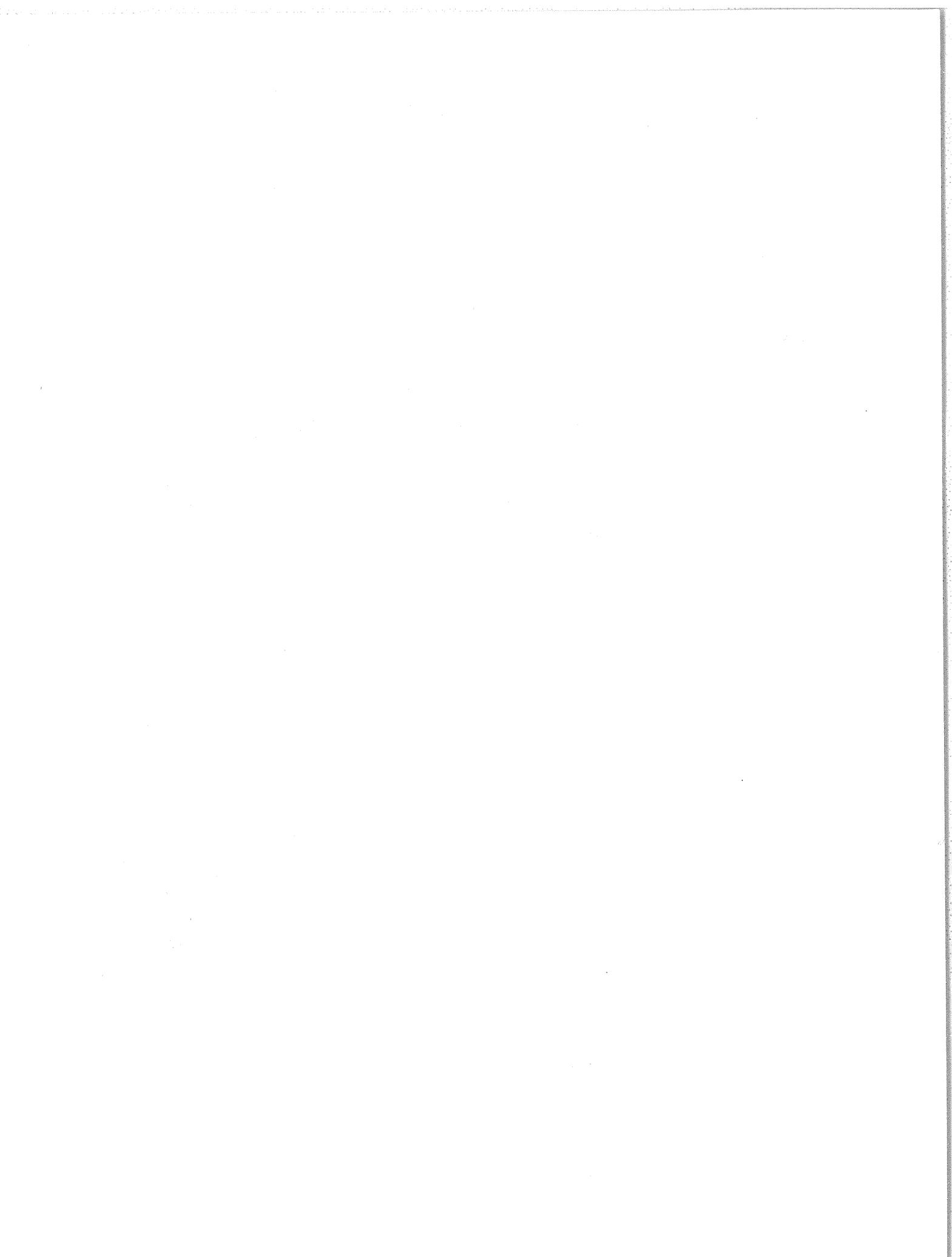
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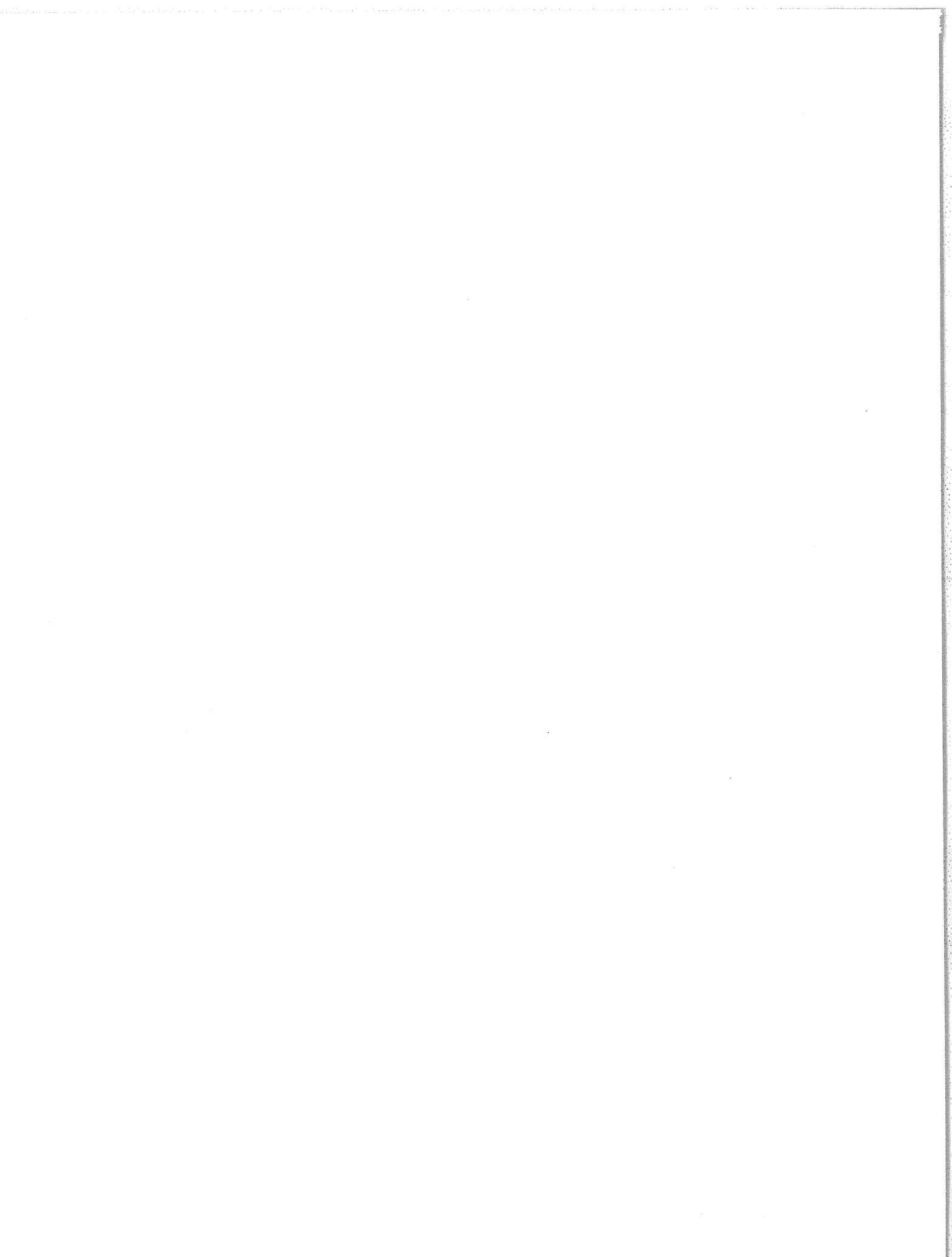
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1. CONTRIBUTED PAPERS

1.1 Introduction to IRI 1979

by

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This report is the second edition of the International Reference Ionosphere (IRI) succeeding the first one, IRI 1978, and edited by the International Scientific Radio Union (URSI). It has been prepared by the Steering Committee (St. C.) on the International Reference Ionosphere (IRI) established by URSI and COSPAR with, at present, the following members: S.A. Bowhill, K.S.W. Champion, A.D. Danilov (v. chmn.), K. Rawer (chmn.), M.J. Rycroft, and J. Taubenheim.

The aim of the IRI is to establish a summary compendium of height profiles through the ionosphere for the four main plasma parameters, namely: plasma density, plasma temperatures of electrons and ions, and ion composition. These parameters are generated from a descriptive model containing reliable data that can be extracted and used to obtain average profiles. The IRI-generated parameters compare well with COSPAR International Reference Atmosphere (CIRA) values (last edition CIRA 1972). Basic material was contributed to our work by many colleagues. In addition to the members mentioned above, material was contributed by: P. Bauer (France), K.I. Maeda (Japan), S. Gnanalingam (Sri Lanka), H.G. Booker, J. Evans, J.V. Lincoln, H.A. Taylor (USA), E. Kazimirovskij, and T.N. Soboleva (USSR).

IRI is not a theoretical model. The emphasis of IRI is to summarize reliable experimental data when available. During the years of preparation, the St. C. made suggestions on the types of additional data to be included and other kinds of measurements to obtain data. There was, for example, a special symposium on the lower ionosphere in 1973 at Konstanz during which an agreement was reached on what data should be considered as primary inputs in that height range.

The sources used for the present IRI edition have been described in several publications, the most recent being Rawer [1977] and Rawer et al., [1978a,b]. From these papers it appears the "data base" is different for the different parameters and is rather poor for a few of them, in particular for ion composition. Regardless, the St. C. decided to publish a first edition of the IRI in 1978 in the hope that publication of a preliminary model would encourage research workers in the field to concentrate on filling the gaps. It is hoped this model will be discussed and criticized by colleagues working in different fields who are interested in the ionosphere.

A few improvements were introduced in the new programs IRIAL7 and IRIFO7. These resulted from experience in my own group, and remarks obtained from colleagues, in particular S. Gnanalingam, T.L. Gulyaeva, and H. Maeda. Improvements were made to the electron density profile between the E and F regions for nighttime, and to the ion compositions below 300 km. Inconsistencies created under certain conditions with the original numerical programs were avoided with the new ones. Most of the corrections were given in the sheet entitled "Corrections to IRI 1978" (May 14, 1979) and follow up sheets dated August 20, 1979 and July 15, 1980. The present edition was current as of December 1980. There were a few more improvements made with regard to the classification of seasons. For the ion composition the transition from the lower to the upper height range was made continuous. More comments were obtained at the workshop on IRI held at Budapest in 1980. These comments will be used to make improvements and produce an amended edition later.

After combining the basic data from different sources, a critical evaluation of them was the first step undertaken. The St. C. found that a selective process was more appropriate than a statistical approach, where all the data would be combined without evaluating them. Various types of information not used as primary input can now be compared with the profiles presented. This enables conclusions to be drawn which will eventually lead to improvements of our model. It particularly applies to different types of radio wave propagation data not used as primary inputs.

A preliminary report was presented to the General Assembly of URSI in 1975 [Rawer et al., 1975]. URSI asked for the presentation of IRI in a form which could be readily applied by workers in the field. Unlike the presentation in the earlier editions of CIRA, it was felt that a computerized approach should be undertaken. In essence the IRI is a computer program which produces profiles (see section 5). To provide examples and give an opportunity to show the variability of the output we have produced numerical tables for certain locations and conditions (see section 4.1), as well as Figures with profile shapes for another, smaller set of basic conditions (see section 4.2). All examples were computed with the program IRIAL7.

The main programs are given in ALGOL-60* and FORTRAN-4. The profiles are calculated by descriptive functions suitably layered, with different equations being applied to the different height ranges. Standard coefficient input is now done inside the program itself, e.g. the ALGOL-procedures KOEFFB, KOEFF., KOEFG1..3, with the call-in by procedure SUFE. If input by a peripheral is desired, the data can easily be extracted from these procedures.

H.G. Booker [1977] expressed the opinion that, for full wave computations, a unique analytical profile function for the plasma density would be preferable. He proposed a particular system called "skeleton functions", which can be approximated by a sum of several Epstein-step-functions. These are of the form $1/(1 + \exp(-z))$, asymptotic values being 0 and 1 for z going towards large negative and positive values. A description along these

*ALGOL-60 program may be obtained upon request to World Data Center A for Solar-Terrestrial Physics. The FORTRAN-4 program will be found in Section 5.

or similar lines may be a future project. It appeared too difficult to deduce the parameters of these functions from the established characteristics of the ionospheric layers (see, however, T.L. Gulyaeva, 1981). Therefore, we felt that Booker's proposal could not be incorporated in our present schedule. To take account of his viewpoint, we have produced some profiles with the presentation he proposes. To this end, the Epstein parameters were obtained by a screen-controlled trial-and-error procedure of specific profiles. The programs to establish such profiles are IRIAL (ALGOL-60) and IRIALF (FORTRAN-4) by use of the input parameters IRIPAA [Rawer et al., 1978c, p. 74].

Two height ranges for temperature (different for ion and electron temperatures, day and night) were given with the upper or lower region described by one analytical function each.

For ion composition, we followed Booker's [1977] proposal with an amendment: instead of using the above step function we took the integral function obtained from it. In its simplest form it reads

$$A \cdot \ln((1 + \exp(z)) / (1 + \exp(z_0)))$$

and may be called an Epstein-transition, namely between the asymptotes $y = \text{constant}$ for large negative values of z and $y = A \cdot z + \text{constant}$ for large positive values. The full profile is then described as a sum of such transition functions with a suitably chosen center coordinate z_0 and steepness A .

CIRA started with profiles for given locations, and the original intention was that the IRI should be similarly restricted. Later, it was found that a worldwide description would be more valuable. Sufficient data for all parameters and locations was not available to write a complete description. We followed an intermediate procedure and tried to give a continuous description in space and time where it was felt this was readily attainable.

The difficult question of which description would be taken for the worldwide variation of the values of the peak plasma density and its height was decided by taking over the well-known descriptive program of CCIR [Comité Consultatif International des Radio Communications, 1967] which is based on a particular kind of Fourier and Legendre development. The original Jones and Gallet [1960, 1962] publications produced the analysis in geographic coordinates. Introduction of Rawer's [1963] "modified dip" coordinate (Modip) considerably improved the consistency of the charts. Modip was taken as a basic variable in the final program adopted on the proposal of W.G. Baker [CCIR, 1967]. The geophysical argument is that, when interpolating on maps, the well-known magnetic dip control therefore needs a magnetic field model which is given in procedure FIELD G. Additional information may be found in Sheikh et al. [1978]. In order to obtain the peak height, the CCIR program for the propagation factor M(3000)F2 is used together with an empirical relation based upon a critical review of recent publications [Bilitza et al., 1979].

We are aware that the CCIR schedule widely used for communication predictions has shortcomings, especially in the regions where ionospheric sounding stations are missing as in areas over the oceans and in some parts of the Southern Hemisphere. The set of coefficients needed for the computations was in fact uniquely derived from the measurements of groundbased ionosonde stations. These are recorded on the CCIR data tape which can be obtained at the International Telecommunication Union, Geneva. World Data Center-A/STP has a shortened version which contains only the coefficients for foF2 and M(3000)F2. The program assumes the use of the WDC-A/STP version (procedure/subroutine CCIRCA). A specific effort is underway in CCIR-IWP 6/3 to improve the data bases with satellite measurements. The St. C. feels this particular problem is outside of its own jurisdiction.

It was felt for users not in possession of a CCIR or WDC-A/STP coefficient tape an alternative description should be readily available. The programs IRIAL7 and IRIF07 provide for the replacement of the CCIR representations with a much simpler description proposed by Chiu [1975]. His set of equations is largely based upon research conducted in Japan by T. Yonezawa [1971]. It does not use the many parameters that the CCIR model uses, so its ability to reproduce complex features is limited. In order to accomplish this simplification the special procedure/subroutine F2OUT (IRIAL7) must be cut out and be replaced by the procedure/subroutine IONDEM. The call to procedure/subroutine F2OUT must, of course, be replaced by a call to IONDEM with the correct variables in both programs.

The simplified programs, called IRIAL7A and IRIF07A do not use the CCIR or WDC-A/STP tape as input. The worldwide representation of mean peak values of foF2 and hmF2 is better with the original programs than with the use of the subprogram IONDEM. The profile definition is based on the peak values, so a choice of the peak description does not seriously change the relative profile when a peak is taken as reference. As a third option, the program can also be applied with direct input of the peak data when these are available from other sources. The profile shape of the topside electron density is not deduced from incoherent scatter data but from a summary of topside ionosonde measurements (mainly ALOUETTE) as given by Bent et al. [1970]. The topside slope was checked against available incoherent scatter results and the results were found to agree rather well.

Unfortunately for our purpose, Bent's description admits certain discontinuities in the slope of the electron density vs. height profile and has only a limited number of combinations of the input variables (plasma frequency, geomagnetic latitude, and solar activity). In order to have a continuous, analytical description and use Booker's proposal (see above), Bent's profile parameter is now expressed by a sum of two Epstein step-functions, the coefficients of which are dependent on the above variables. This includes some smoothing of Bent's original tables. It was recently shown by S. Ramakrishnan et al. [1979] that our "harmonized" Bent model is in better agreement with determinations of standardized topside profiles evaluated very carefully by W. Becker [1975]. In the future it is hoped more detailed comparisons can be made from in situ satellites, from new sounding satellites, and from profiles obtained by incoherent scatter techniques.

The sources of information used for the bottomside profile shape were described in earlier publications [Rawer et al., 1978a].

The bottomside electron density profile is composed of five height ranges which are numbered 2 through 6. We have six ranges, since the last one is subdivided. The ranges and designations are shown in Figure 1. The profile functions given in the subprograms NE/XE 2...6, and their functions are explained in the program comments.

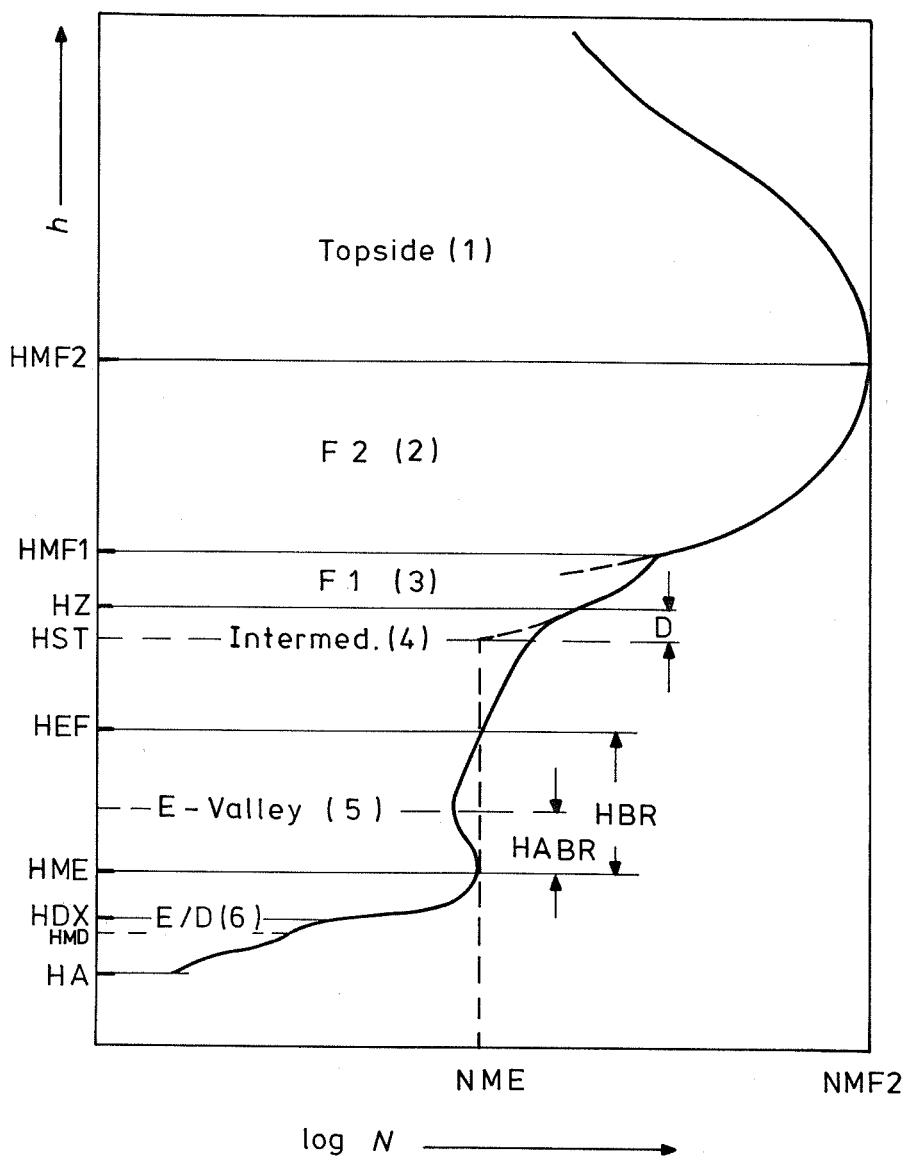


Fig. 1. The IRI model profile.

Let us first consider regions (5) to (2) beginning with the "valley region" (5), which starts at the peak height HME of the E region. Characteristic HME values were estimated from special ionogram reductions combined with Maeda's [1971] compilation of in situ rocket measurements. The shape function NE5 was designed after some incoherent scatter measurements. Around noon the depth of the valley is quite small, there is even no valley (condition NOT VALLEY) at lower latitudes. At low solar height and during the night there is a deep valley above the E region. Rawer et al. [1975] used a then-recent compilation from Soboleva [1973] giving an extremely low density value at the minimum height (HME + HABR in Figure 1). Later on, H.G. Booker found out that Schumann resonance cannot be understood with such a deep valley. Our procedures TAL and NE5 were adapted to older computations [Maeda, 1969, 1971] which at night give a larger density value in the valley, so the valley is not so deep.

The upper edge of the valley region (5) is found at height HEF, which is the sum of HME + valley thickness HBR (Figure 1). Values of HBR were mainly derived from incoherent scatter data. In the absence of a valley (condition NOT VALLEY) we put HBR = 0. HEF is the lower edge of the "intermediate region" (4) which was introduced to bridge the gap between the valley and the F region above.

Jumping to the F region, we distinguish two classes according to whether an F1 layer is present (condition F1REG) or not (NOT F1REG). In both cases we use the subdivision in regions (2) for F2 and (3) for F1, but if F1 is absent both functions/procedures NE2 and NE3 are identical. This is arranged by putting C1 = 0 when condition F1REG is not valid. C1 is the amplitude of the additional term in NE3 (which produces a stronger gradient at HMF1 when F1REG is valid).

In most cases there is a gap between HEF and the F region, called the "intermediate region" (4). To close the gap, we determined the height HST where the extrapolated F-region profile NE3 reaches the value of NME. To avoid a layer of constant density between HEF and HST the upper edge of the intermediate region is shifted upwards to meet a higher density value. This higher level is called HZ. It was chosen as the arithmetic mean of HST and HMF1 (Figure 1). If no F1 layer is present (condition F1REG not valid) NMF1 is formally replaced by the mean value between NME and NMF2, the corresponding height then being taken as a fictitious value for HMF1 (since in such cases C1 = 0 this has no effect upon the profile shape). If this procedure leads to a "bottle neck" the value of HMF1 is shifted further upwards and may even reach HMF2. A discontinuous method was used in IRI-78 and in the first correction. This has been replaced by a continuous method in the second correction and the present programs IRIAL7 and IRIF07.

More difficult conditions are set when HMF1 is rather low and the thickness parameter of the F region B_0 is large. These conditions may occur during certain night situations when HST goes below HEF, i.e. there is a "negative gap". These cases are resolved by adjusting an exponent (b_1) in NE2. The program will cause a smooth interpolation between the levels HEF (or HME if VALLEY is not valid) and HZ (see procedure/function NE4).

Except for the F2-peak data, derived from the CCIR coefficient method, the characteristics of the different layers are deduced from descriptive formulas found in the literature. The critical frequencies (which correspond to peak densities) and the zenith-angle, the solar cycle, and latitudinal dependencies were taken from Eyfrig [1955] and Ducharme et al. [1971, 1973] for foF1 (procedure/function FOF1ED), earlier foE formulas were replaced by those of Kouris and Muggleton [1973 a, b] (procedure/function FOEEDI). Thickness parameters were adapted according to general knowledge, mainly obtained by ionogram reduction.

No information is given in IRI about the occasional existence of sporadic layers, despite the importance of Es layers to radio wave propagation and their interest as ionospheric phenomena linked with effects of upper atmosphere dynamics. It was not practicable to have this feature in our computer programs. Es layers are usually quite thin (often less than 1 km thick) and appear irregularly in space and time. They have a clear preference for the summer season, areas near the magnetic equator, and the auroral zones. For more information the reader is directed to the special conference reports edited by Smith and Matsushita [1962, 1966, 1968, 1971]. The lower ionosphere region (6) is modeled from procedure/function NE6. A substratification is admitted at height HDX, slightly above HMD. This latter characterizes the inflection point in the D-region shape [Mechtly and Bilitza, 1974] with density NMD. NMD (at HMD), HMD and the shape parameters are generated in procedure/function NE6 which is derived from different sources as indicated in D. Bilitza's first contribution (section 1.2) to this publication. Two different functions are used for the bottomside E region and in the D region; they are matched at level HDX.

The D region is still a weak point in our description; data are scarce, and worse than that, different techniques seem to lead to different results. The numerical values were taken from mid-latitude in situ measurements only [Mechtly and Bilitza, 1974]. The formula could be improved by using equatorial measurements, and was checked with some radio wave propagation results obtained from Gnanalingam and Kane [1978]. Our formula is certainly not applicable at auroral and polar latitudes. We are also aware that some discrepancies with absorption measurements emerged from computations using our profiles and standard collision frequency data [Singer et al., 1980]. We also refer to the semi-empirical model of Mitra and Somayajulu [1979].

Profiles of the electron temperature, TE, were originally deduced from incoherent scatter measurements, and are represented by expressions for high and low altitudes. The distinctive level between both ranges, H_0 , was chosen between 200 and 400 km. In the upper range one noon and one midnight profile are given, depending on the geomagnetic latitude. For a given hour the program interpolates between the two times. In the lower range TE is linearly matched with the neutral temperature, TN (i.e. the average of CIRA 72, procedure TN in the programs). Both temperatures are identical at HTA = 120 km. We did not compensate for a solar activity effect, even though it is obvious that more energy is fed into the aeronomics system during periods of high solar activity. Since the electron density is much greater during these periods, we have higher thermal conductivity in the electron gas and thus an effect producing a temperature decrease. Measured data available at present are rather scarce. Long term experimental evidence is available from only one incoherent scatter radar station (Millstone Hill). The results show conditions are rather involved, and no clear solar cycle effect could be identified [Evans, 1973 and later data]. We are urgently in need of more long term data.

The recent analytical model describing the AEROS-A measurements [Spennier and Plugge, 1979] compares well with results from Millstone Hill and Jicamarca for day and night. It gives values which, by day, are slightly too high for Arecibo. This input combined with standard height profiles from the incoherent scatter stations was used, however, with a simplified descriptive function, for the height range 200 to 1000 km.

As for the ion temperature, TI, we rely primarily on results from incoherent scatter stations comparing these with some data from AEROS.

At the bottomside, all temperature profiles are adjusted to the average CIRA [1971] neutral temperature value at 120 km. Above this height a linear increase of (TE - TN) with height is assumed. The computing schedule is discussed and explained in D. Bilitza's second contribution to this publication (section 1.3).

It does not allow TE or TI to become less than the neutral temperature TN.

The ion composition data are too scarce to produce a continuous description in space and time. Below 200 km the recently established models of Danilov and Semenov [1978] were approximated analytically. The relative percentages of O_2^+ and O^+ are represented by a sequence of Epstein-transitions, two for O_2^+ but four for O^+ . Near the F2-peak height there is almost only O^+ . From the AEROS data set, we determined an upper fixpoint of 98% O^+ at 300 km (but at 249 km for high solar activity in the summer season) and lower fixpoint at 290 (237) km. Above and below this range of O^+ predominance, the profile function permits transitions of the parameters which were adapted to the (summarized) data measured with rockets (below) and satellites (above). This is also done for the O_2^+ profile but with only three ranges (two transitions). NO^+ is determined so that all three ions together reach 100%. Above the O^+ peak region light ions are permitted. Since nighttime observations are missing, the sunset curves are provisionally assumed to be valid during the whole night (an assumption possibly far from the truth). For higher altitudes AEROS data were combined with some results obtained by Taylor [1971].

Our program only allows for O^+ , H^+ , and He^+ as atomic ions. From OG0-6 observations it appears that about 5-10% of the share attributed to O^+ could possibly be N^+ . Similar evidence exists also from AEROS. The expressions give only average shares. They cannot account for special phenomena such as molecular ions at greater heights, as were observed under disturbed conditions.

Positive cluster ions appear regularly in the D region below 90 km. Existing data are not good enough to describe readily the relevant profiles. Clusters are not identified in the computer program which gives NO^+ . The ratio of clusters to the total positive ion density might roughly be estimated from Figure 2 (after Danilov and Semenov). Unfortunately, these data are scarce and only available for mid-latitude, at low solar activity, in summer.

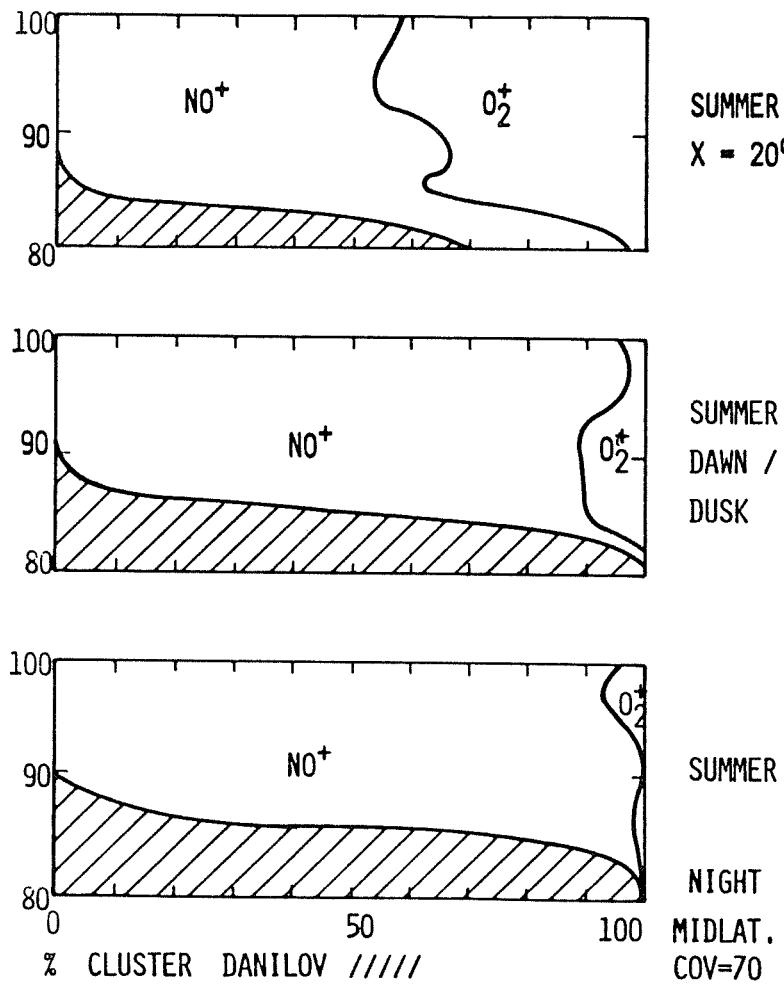


Fig. 2. Percentage of cluster ions at various heights.

At the present time, only a rough guess can be made for the height of the transition between electrons and negative cluster ions. Numerical values are not given in our program. Existing evidence from a few mass spectrometer measurements seems to show that sharp transitions occur at altitudes between 68 and 74 km during the day and 70 to 78 km during the night [Arnold and Krankowsky, 1977]. It appears premature for the official IRI program to introduce numerical equations describing the conditions at the bottom of the ionosphere (e.g. cluster ions), or at great heights (N_e , T_e). Reference is made to preliminary relations established by individual authors. We have asked two authors working with measurements and theory of ion composition in the lower ionosphere to give written reports in this volume. The reader is directed to the comprehensive contribution by F. Arnold (which includes the stratosphere (section 1.5) and to the shorter one by B.S.N. Prasad and S. Mohanty (section 1.4).

It was found that at altitudes above 1000 km data obtained by different methods are not in very close agreement with each other. Further critical examination of the plasma parameters in this region of space is urgently needed and is planned by COSPAR. At the present time our profiles are confined to below 1000 km altitude. M. Rycroft is in charge of these problems in the St. C. As a provisional guide we refer to the recent paper by Chiu et al. [1979].

IRI describes monthly average values. Values for individual days are spread around with roughly the following (2 sigma) dispersion ranges:

	Heights	Peak Densities	Temperatures
F region	+15%	+30%	+30%
E region	$\pm 5\%$	$\pm 10\%$	$\pm 10\%$

These indications are not valid at latitudes in the auroral zone or on the polar cap where larger fluctuations must be expected. The basic values are not good under these conditions. This includes the CCIR coefficients. An example can be found on page 217: for Modip -70 degrees, during the polar night, the CCIR map of $M(3000)F2$ combined with our empirical relation gives a value below 200 km for HMF2, which is probably much too low.

A more detailed description of how the programs can be used is given in the following Technical Note (section 2) which, together with the comments in the program itself, should allow users to make the program workable on their own computers. The ALGOL and FORTRAN programs IRIAL7 and IRIF07 can be obtained on request as punched cards (026 or 029 punch) or on magnetic tape in various formats and densities. The tape can be delivered either in ASCII(2) or EBCDIC(1). The tape contains the programs mentioned above as well as the CCIR coefficients and the fully analytical profile program IRIALA. Requestors wishing a copy should write to

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Acknowledgments: The Deutsche Forschungsgemeinschaft sponsored D. Bilitza's and H. Thiemann's activities in this project (grant Ra 68/65). Great help in the present edition was a rearranged and corrected FORTRAN program from T.L. Gulyeava (IZMIRAN, USSR).

1.2 Electron Density in the D-Region as Given by the International Reference Ionosphere

by

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ABSTRACT

The model for the electron density in the D region as used in the International Reference Ionosphere (IRI) is explained and the actual model functions are given depending on time, solar zenith angle and solar activity.

Introduction

A major problem in modeling D-region electron density is selection of experimental data which are both accurate and representative of the unperturbed ionosphere.

The evaluation of the relative accuracies of various methods of measuring electron concentration in the D region was one of the objectives of the 1973 COSPAR Symposium on the Lower Ionosphere held in Constance, F.R.G. Participants in the Symposium arrived at important conclusions:

1. D-region profiles of greatest accuracy are derived from measurements of differential absorption and/or differential phase (Faraday rotation) of radio waves propagating between the ground and ascending rockets. Improved resolution is possible when Langmuir dc-probes are flown on the same rockets. However, they must be calibrated on every occasion by radio data.
2. All the ground-based techniques (VLF, LF, partial reflection, and wave interaction) begin with assumed profiles of electron concentration and collision frequency for the inversion of propagation integrals. Available measurements are never sufficiently comprehensive to determine unique profiles without relatively large probable errors.

The foundation of these conclusions is discussed in detail by THRANE [1974], THOMAS [1974] and SECHRIST [1974]. The representation used in the International Reference Ionosphere (RAWER et al. [1978c]) which will be described in this paper is strongly based on a rocket data evaluation done by MECHTLEY and BILITZA [1974].

Height Dependence

The typical electron density profile in the D region shows a steep gradient just below the E-layer maximum, reaching an inflection point at HMD, NMD and decreases to lower heights with a much weaker gradient (Fig. 1). As recommended by MECHTLEY and BILITZA [1974] we used a third degree polynomial centered at the inflection point to approximate the logarithm of the density

$$N_e^1(h) = NMD \cdot \exp(FP_1 \cdot X + FP_2 \cdot X^2 + FP_3 \cdot X^3)$$

$$X = h - HMD$$

$$\left. \begin{array}{l} \text{HMD/km height} \\ \text{NMD/m}^{-3} \text{ density} \end{array} \right\} \text{of the inflection point}$$

For HMD to become an inflection point the second derivative has to be zero. That gives us

$$FP_2 = \frac{FP_1^2}{2}$$

We also find that FP_1 is the logarithmic derivative at the height HMD

$$FP_1 = \frac{d \ln N_e^1}{dh} \quad (h=HMD)$$

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Finally, FP_3 can be explained in terms of a scale height S which is the height difference between HMD and the height where the electron density has dropped to N_{MD}/e .

$$FP_3 = (FP_1^2 * S^2 / 2 - FP_1 * S - 1) / S^3$$

Because the gradient above HMD is much greater than it is below HMD, we have a different scale height above HMD, S_a , and a different FP_3^a .

$$FP_3^a = (FP_1^2 * S_a^2 / 2 - FP_1 * S_a - 1) / S_a^3$$

These considerations make it easy to calculate the model parameters FP_1 , FP_2 and FP_3 from experimental graphs. All you need is to find the inflection point, the logarithmic derivative at this point and the two scale heights mentioned above. An example is shown in Figure 1. To connect this profile function with the values at the E region maximum we recommend the following function

$$N_e^2(h) = NME \cdot \exp(-D_1 \cdot (HME - h)K)$$

$$\left. \begin{array}{l} NME/m^{-3} \text{ density} \\ HME/km \text{ height} \end{array} \right\} \text{of the E-region maximum}$$

which proved to be representative for the given data feature. D_1 , K are determined as to meet the N_e^1 function at the height HDX.

$$K = DNDX \cdot (HME - HDX) / (NDX \cdot \ln \frac{NDX}{NME})$$

$$D_1 = DNDX / (NDX \cdot K \cdot (HME - HDX)^{K-1})$$

$$DNDX = \frac{dN_e^1}{dh} (h=HDX)$$

$$NDX = N_e^1 (HDX)$$

$$HDX = HMD + S_a$$

Besides the described variation with height, there are a number of other profile shapes which are less frequent and show more disturbance. These profiles were not considered in our present analysis, dealing only with the quiet ionosphere. From the more than 200 profiles given by MAEDA [1971], MECHTLEY and BILITZA [1974], DICKINSON et al. [1976], GUPTA [1977] and GNANALINGAM [1976] only about 80 were useful (in the above stated sense) for our modeling purposes.

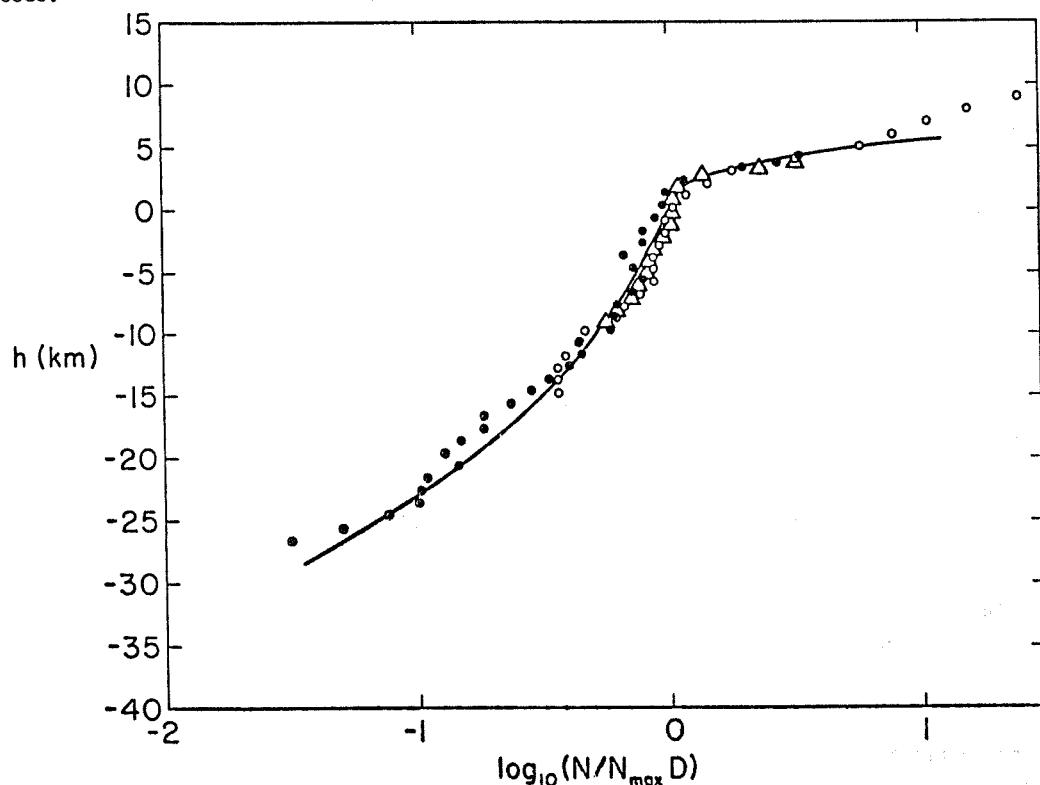


Fig. 1. Typical D region electron density profiles taken from MECHTLEY and BILITZA [1974], together with the model.

Variation With Time and Latitude

The remaining profiles were normalized to their point of inflection and sampled into day and night groups for low and middle latitudes. Most of the variation was obviously removed by the normalization, and only FP₁ showed latitudinal differences. The model parameters for day and night are listed in Table 1.

Table 1. Model coefficients for day and night.

	HMD km	$\frac{\Delta \ln N_e}{\Delta h (h=HMD)}$ km ⁻¹	S _a km	S km	FP ₁	FP ₂	FP ₃ ^a	FP ₃
DAY	low	0.02			0.02	$-2 \cdot 10^{-4}$	$9.37 \cdot 10^{-3}$	$4.89 \cdot 10^{-4}$
	middle latitude	81	4.6	-11.5	0.05	$-1.25 \cdot 10^{-3}$	$8.18 \cdot 10^{-3}$	$1.707 \cdot 10^{-4}$
NIGHT		0.05	4.5	-4	0.05	$-1.25 \cdot 10^{-3}$	$8.79 \cdot 10^{-3}$	$1.22 \cdot 10^{-2}$

The density at the inflection point shows a strong dependence on the solar zenith angle and solar activity. A good representation is given by the following function:

$$NMD/m^3 = F(R_{12}) \cdot 10^{8*} \exp\left(\frac{0.1}{(\cos Z)^{2.7}}\right)$$

$$F(R_{12}) = 6.05 + 0.088 \cdot R_{12}$$

Z = Solar Zenith Angle

R₁₂ = Smoothed Zurich sunspot number

as is seen in Fig. 2.

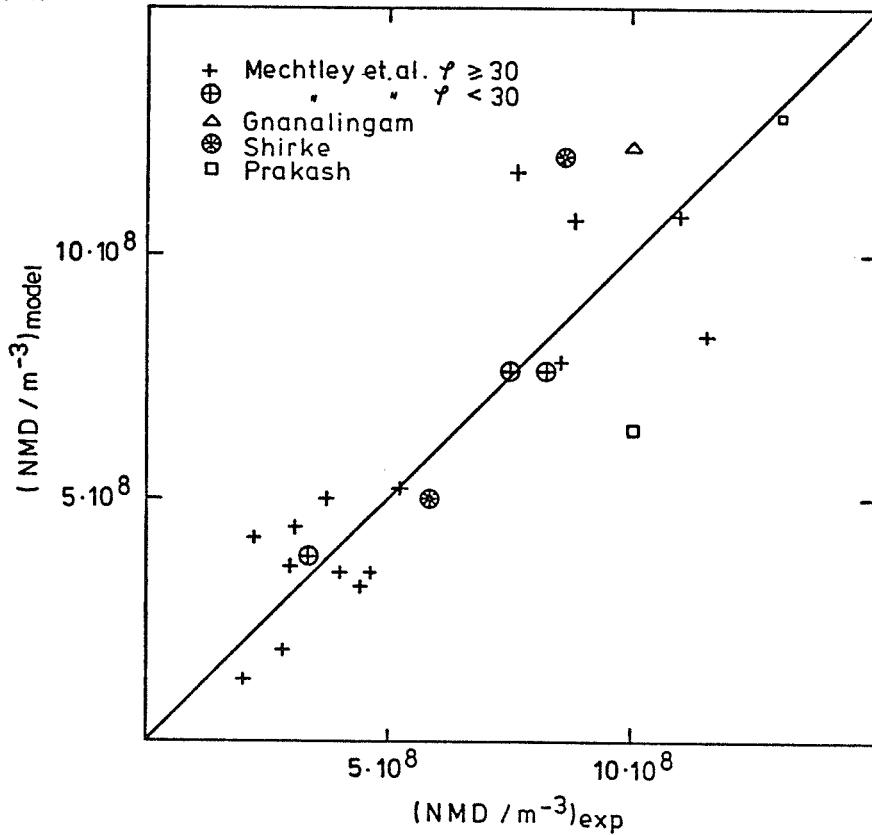


Fig. 2. Comparison between measured and model value for the density at the inflection point (References: Mechtly et al. [1974], Gnanalingam, Shirke, and Parkash private communications).

To connect this daytime behavior with the typical nighttime value $NW=4 \text{ } 10^8 \text{ m}^{-3}$, we recommend the following procedure. Calculate the solar zenith angle Z_s for which the model reaches the nighttime value

$$Z_s = \cos^{-1} \left[\left(\frac{0.1}{\ln(F \cdot 10^8 / NW)} \right)^{\frac{1}{2.7}} \right]$$

and set NMD equal NW for zenith angles larger than Z_s .

It should be noted that the nighttime coefficients are based on a still small data base mainly guided by Maeda's and Gupta's data and also ELF propagation calculation by BOOKER [1976].

It seems interesting that the winter anomaly profiles as reported for example by BEYNON et al. [1976] can be approximated by multiplying the "normal" NMD (as it would be given by our model) by a factor of 10.

To get a continuous variation between day (DV) and night values (NV) we recommend the following step function, which was used in the IRI:

$$W = MW = \frac{DV - NV}{1 + \exp(-(t - SA)/D_1)} + \frac{NV - DV}{1 + \exp(-(t - SS)/D_2)}$$

t/h time

SA, SS/h time of sunrise and sunset

D_1, D_2 transition time at sunrise and sunset. We put $D_1=D_2=1$ h.

1.3 Models for Ionospheric Electron and Ion Temperature

by

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Abstract

By using measurements of the incoherent scatter stations Millstone Hill, Arecibo and Jicamarca, and data measured by the Retarding Potential Analyzer (RPA) aboard the satellites AEROS-A and B we have constructed models of the ionospheric temperatures in the height range 200-800 km to be used for the International Reference Ionosphere. Our models give the overall global, time, and height dependence but exclude one on solar activity and specific diurnal behavior.

Introduction

There have been different attempts to model the ionospheric temperatures. A great number of scientists investigated the relationship between the temperatures and the electron density to make use of the quite representative electron density models. For these studies the incoherent scatter stations meet the ideal requirements with their simultaneous measurements of electron density and electron and ion temperature. LEJEUNE and WALDTEUFEL [1970], WALDTEUFEL [1971] and LEJEUNE [1972] examined the data of the stations St. Santin/France and Arecibo/Puerto Rico, MAHAJAN [1977] worked with data from Arecibo, BILITZA [1975] with data from Millstone Hill/USA, and TAYLOR and RISK [1974] with data from the U.K. station Malvern. All these theoretical and empirical examinations show an anticorrelation between the electron density and temperature. One can understand this feature from theoretical considerations. The heat gain of the electron gas depends on the electron density whereas the heat loss depends on the square of the electron density. But for greater heights these correlation considerations are made more difficult by the increasing importance of heat conduction with its strong latitude dependence. SPENNER et al. [1977] have investigated the global features of this anticorrelation by using data of the satellite AEROS-B. They found that the anticorrelation holds true only in daytime and within a dip of +40°, and is not sufficiently significant at the magnetic equator. The same is true for the correlation between ion temperature and electron density, which is explained by the strong heat contact between electrons and ions. By using a height dependent correlation, BRACE and THEIS [1978] were quite successful in representing electron density and temperature data measured by the AE-C satellite. Considering the International Reference Ionosphere it seems unreasonable to incorporate a correlation between the parameters because in this way degrees of freedom are lost.

Different from this there have been attempts to approximate satellite data by an expansion in spherical harmonics and other series depending on longitude, latitude, height and local time. SPENNER and PLUGGE [1978] have done this for the AEROS-RPA data, while DORLING and RAITT [1976] approximated the ESRO-4 data in this way. Besides the problem of misrepresentation in regions with no satellite data this method is limited to one satellite mission and corrections introduced from other measurements can be incorporated only by changing a large number of coefficients.

In this work, an attempt was made to approximate the latitudinal dependence of the electron and ion temperature as represented by the AEROS satellite data and the height dependence as measured at the incoherent scatter stations by simple analytic functions. That seems adequate to the present state of data collection.

The Data

The data used in this study are summarized in Table 1, noting the time and solar activity range. The AEROS data have been longitudinally averaged and mean values for the height ranges 150-250, ..., 650-750 and 5 degree magnetic latitude intervals have been calculated. This was done for day (14-26 LT) and night (2-4 LT) time. Due to the orbit of the AEROS satellites these were the main measurement times. The incoherent scatter (ICS) data have been averaged over the whole period given in Table 1 and for the time intervals 11-13 LT and 23-1 LT. In a first attempt the data were in addition sorted by season and solar activity but no clear dependences were recognizable.

Table 1. Location and time of the used data

STATIONS AND SATELLITES	LOCATION		MISSION TIME	R ₁₂	MEDIAN IS CALCULATED FOR	NUMBER OF THE DATA POINTS PER MEDIAN DETERMINATION
	GEOG.	GEOM.				
ARECIBO 2 PUERTO RICO 1	18N 293E	30N 2E	12/71-12/72 7/66-6/70	50-73 50-100	THE WHOLE MISSION	50 100
JICAMARCA PERU	12S 203E	1N 352E	11/66-4/69	75-110	DAY: 11-13 LT NIGHT: 23- 1 LT	700
MILLSTONE HILL USA	43N 209E	54N 357E	2/72-10/75	25-71		100
AEROS-A			12/72-8/73	40-50	1/73-3/73 ALL LONGITUDES DAY: 14-16 LT NIGHT: 2- 4 LT	50
AEROS-B			6/74-9/75	35-10	6/74-9/74 ALL LONGITUDES DAY: 15-17 LT NIGHT: 3- 5 LT	100

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The Electron Temperature Model

The electron temperature shows a different latitudinal behavior for different heights (Fig. 1). For higher altitudes ($h > 400$ km) the temperature is lowest at the magnetic equator and increases towards the poles. For lower altitudes there is a maximum at the magnetic equator within the low latitude valley. That means the height profiles near the magnetic equator show a maximum at about 250 km whereas for higher latitudes a continuous increasing profile is seen (Fig. 2). That is explained by the decreasing heat conduction towards the equator due to the more and more horizontal field lines. We are aware that this temperature bulb can also occur at moderate latitudes in case the heat loss and gain terms dominate the heat conduction at heights of about 300 km, but this should be considered in an additional solar activity dependence which is not clearly established..

We composed the described feature by the summation of three different functions, one for the latitudinal variation, one for the height dependence and one representing the low latitude bulb.

$$T_e(h, \phi) = f_1(\phi) + f_2(h) + f_3(h, \phi)$$

$$f_1(\phi) = A - B \cdot \frac{g(\phi)}{|g(\phi)|} \cdot |g(\phi)|^n$$

$$g(\phi) = a_1 \cdot \phi + a_2 \cdot \phi^2$$

$$f_2(h) = D \cdot (h - 700)$$

$$f_3(h) = C \cdot v_1(\phi) \cdot v_2(h)$$

$$v_1(\phi) = \frac{\exp(-0.1 \cdot \phi)}{(1 + \exp(-0.1 \cdot \phi))^2}$$

$$v_2(h) = \frac{\exp(-0.03 \cdot (h - h_{\max}))}{(1 + \exp(-0.03 \cdot (h - h_{\max})))^2}$$

$$h_{\max} = 70 \cdot \exp(-1.4 \cdot 10^{-3} \cdot \phi^2) + 200$$

where	A	B	C	D	a ₁	a ₂	n
Day	2325	725	25600	2	3.4	-0.014	1
Night	1600	700	0	0	0.47	0.024	0.5

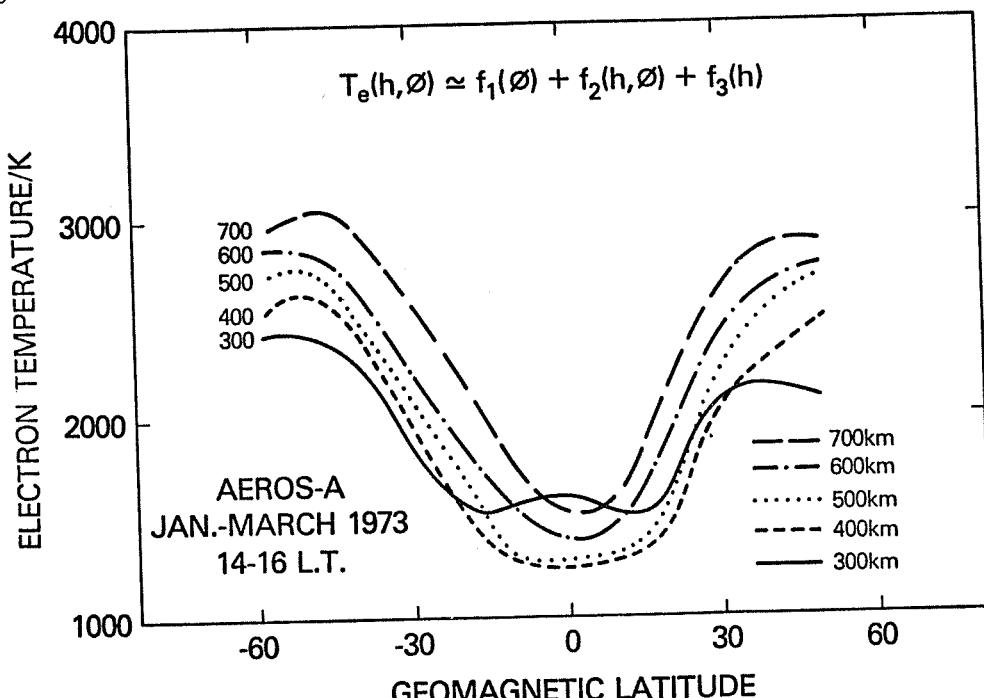


Fig. 1. Latitudinal variation of the electron temperature as measured by the AEROS-A RPA for different heights h , as a function of geomagnetic latitude ϕ .

Function f_1 represents the general latitudinal behavior of the AEROS-A data for all heights ignoring the low latitude bulge. For the height gradient we took a constant value, which gives sufficient agreement in the region 400 to 800 km for the AEROS-A and the ICS data. Below that region we recommend a linear decreasing difference between electron and neutral temperature towards agreement at 120 km. For day and moderate latitudes ($\phi \leq \pm 40^\circ$) our model represents the electron temperature fairly well down to 200 km due to the bulge function. This bulge function is the product of two peak functions one in latitude and one in height, thus giving enhanced values for a region around the magnetic equator and heights near the maximum height h_{\max} . The height function v_2 was established from the ICS data, while the latitudinal part v_1 was derived from the AEROS-A data. Figure 2 shows our model together with the corresponding ICS and AEROS-A mean profiles.

The Ion Temperature Model

The ion temperature as seen by the RPA on AEROS-B shows fairly constant latitudinal values at low altitudes and a significant minimum at the magnetic equator at altitudes higher 500 km (Fig. 3). That is confirmed by the ICS data which show increasing ion temperature with increasing height and this increase being larger for Arecibo than Jicamarca (Fig. 4). For nighttime there is an increase towards the poles being steeper for greater heights. For modeling the ion temperature the height profile was divided in three parts. Above 430 km we use a constant height gradient and different latitudinal representations for day and night. Below a height $HS \approx 200$ km we set T_i equal to the neutral temperature T_n . These two regions are connected by choosing an appropriate HS , namely the height at which the tangent to the neutral profile passes through the ion temperature value at 430 km.

$$T_i(h) = \begin{cases} u(\emptyset) + M \cdot (h - 430) & 800 \text{ km} \gtrsim h \gtrsim 430 \text{ km} \\ u(\emptyset) - \frac{u(\emptyset) - T_n(HS)}{HS - 430} \cdot (h - 430) & 430 \text{ km} \gtrsim h \gtrsim HS \\ T_n(h) & HS \gtrsim h \gtrsim 120 \text{ km} \end{cases}$$

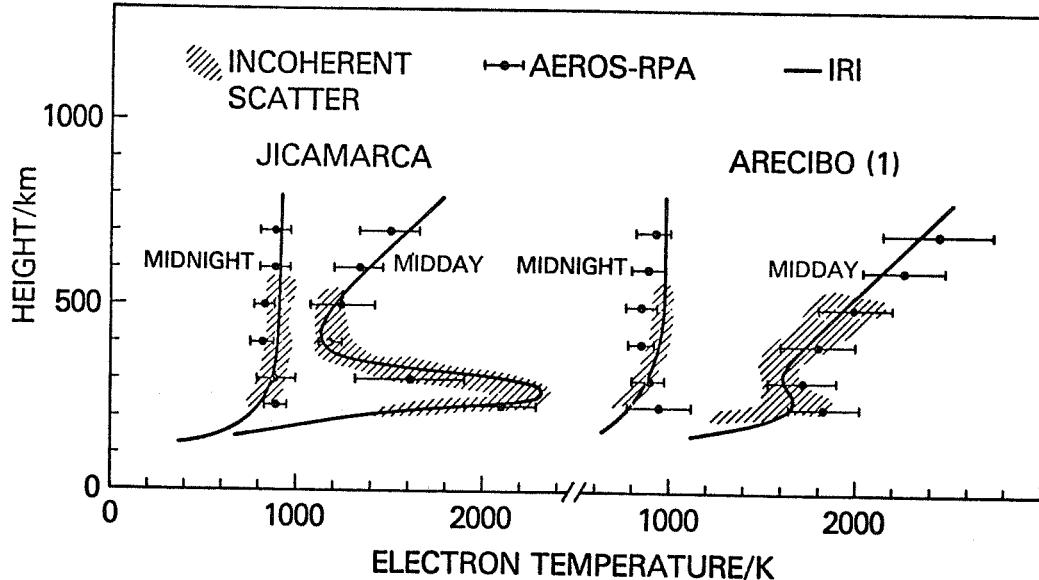


Fig. 2. Comparison between electron temperature data and model for the location of Jicamarca and Arecibo.

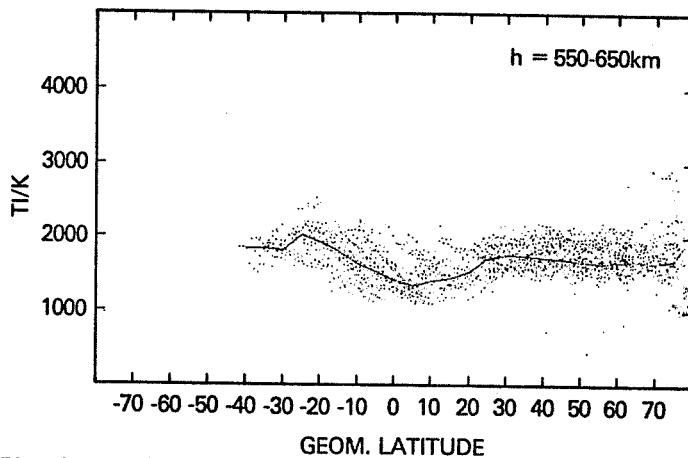


Fig. 3. Latitudinal variation of the ion temperature around 600 km as measured by the AEROS-B-RPA.

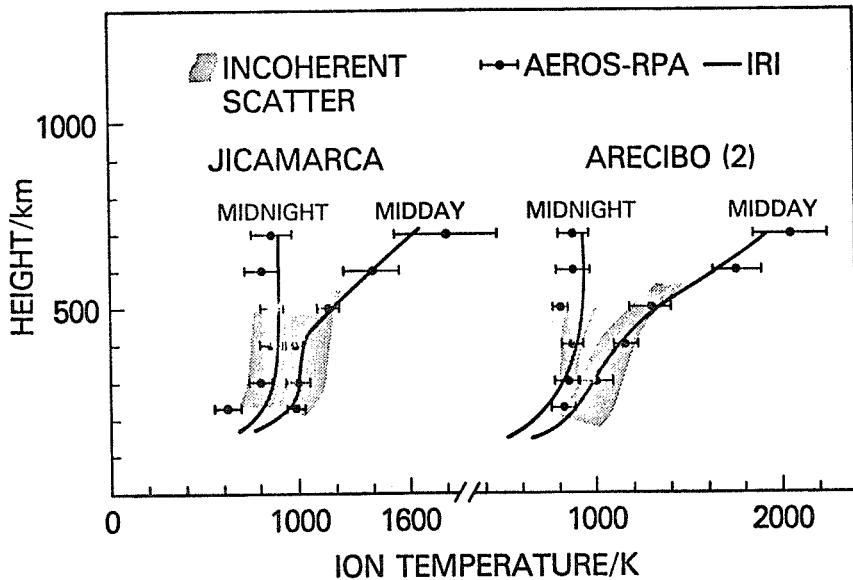


Fig. 4. Comparison between ion temperature data and model for the location of Jicamarca and Arecibo.

	$u(\phi)$	M
day	$u_1(\phi)$	3
night	$u_2(\phi)$	0

$$u_1(\phi) = 1240 - 1400 \cdot \frac{\exp(-0.09 \cdot \phi)}{(1 + \exp(-0.09 \cdot \phi))^2}$$

$$u_2(\phi) = 1200 - 300 \cdot \frac{\cos(X)}{|\cos(X)|} \cdot \sqrt{|\cos(X)|}$$

$$X(\phi) = 0.47 \cdot \phi + 0.024 \cdot \phi^2$$

To get a representation with a steady slope ($T_i(s)$) above HS use was made of EPSTEIN-Step functions [BOOKER, 1977] between the different regions of constant gradient.

$$\frac{dT_i}{dh} = MM_o + \sum_{j=1}^m \frac{MM_j - MM_{j-1}}{1 + \exp(-(h - XSM_j)/G_j)}$$

m = number of the different regions
 MM_0, \dots, MM_m = gradients

XSM_0, \dots, XSM_m = height of the intersections between different regions

G_0, \dots, G_m = transition thickness between different regions

Integration from HS to h gives us the ion temperature

$$T_i^{(s)}(h) = MM_o \cdot (h - HS) + T_n(HS) + \\ + \sum_{j=1}^m (MM_j - MM_{j-1}) \cdot G_j \cdot \ln \frac{1 + \exp((h - XSM_j)/G_j)}{1 + \exp((HS - XSM_j)/G_j)}$$

To get a continuous transition to the neutral temperature at HS we set T_i equal T_n at HS by choosing the appropriate integration constant.

As the heat capacity of the electron gas is much less than that of the ion gas, the ion temperature should not exceed the electron temperature. Therefore we add a fourth region for the case of T_i not less T_e at a height of 1000 km. In this region the ion temperature is approaching the electron temperature. Herewith the parameters are:

$$m = 2$$

$$MM_0 = \frac{u(\phi) - T_n(HS)}{HS - 430} \quad \text{for } u(\phi), M \quad \text{see } T_i(h)$$

$$MM_1 = M$$

$$MM_2 = \begin{cases} MM_1 & T_i(1000) < T_e(1000) \\ \frac{dT_e}{dh}(h = 1000) & \text{elsewhere} \end{cases}$$

$$XSM_1 = 430 \text{ km}$$

$$XSM_2 = \begin{cases} XSM_1 & T_i(1000) < T_e(1000) \\ \frac{T_e(1000) - 10 - u_1(\phi) + MM_1 \cdot XSM_1 - MM_2 \cdot 1000}{MM_1 - MM_2} & \text{elsewhere} \end{cases}$$

$$G_1 = 20 \text{ km} \quad G_2 = 50 \text{ km}$$

Figure 4 shows our model in comparison with the AEROS and ICS measurements. For the neutral temperature the CIRA 1972 model was used.

The Diurnal Variation

In summary the electron and ion temperatures are constant through the day and through the night with transitions at sunset and sunrise. This gross behavior is modified by small seasonal (Fig. 5) and latitudinal changes and special features induced by conjugate sunrise or magnetic storms.

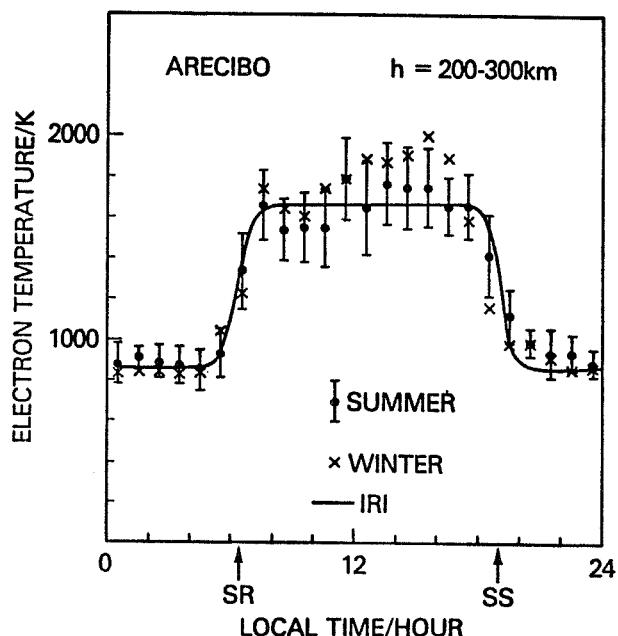


Fig. 5. Day-night variation as given by the data and the model over Arecibo.

In this study we restrict ourselves to the general variation. For the transition between day and night value (T_D and T_N) the already mentioned EPSTEIN step functions have been used.

$$T(h,t) = T_N(h) + \frac{T_D(h) - T_N(h)}{1 + \exp(-(t-t_{SR})/D)} + \frac{T_N(h) - T_D(h)}{1 + \exp(-(t-t_{ss})/D)}$$

$t_{SR/SS}$ time of sunrise and sunset

D = 1h transition time

With a transition time of 1 hour the temporal variation is well represented as shown in Figure 5.

6. Summary

Comparing every measured data point with its model value, we counted the number of data points within ± 10 percent and ± 20 percent strips around the model. The results are listed in Table 2. Almost 70 percent of all the data deviate by not more than 10 percent from the model. Only 10 percent of the 72,000 measured data points lie outside the 20 percent margin. Thus the models described give a fairly good representation of the mean behavior of the electron and ion temperature in latitude, height and time as it is confirmed by satellite and ground based incoherent scatter measurements. Seasonal and solar activity variations of the ionospheric temperatures are not yet clearly established due to the lack of global full solar cycle data. EVANS [1973] has reported an increase in summer and decrease in winter with increasing solar activity for data of the incoherent scatter station Millstone Hill from 1964 to 1968. Special features like conjugate sunrise and magnetic storm effects might be incorporated as adequate supplementary functions to our models.

Table 2. Number of data points within ± 10 percent and ± 20 percent strips around the model.

	AMOUNT	ELECTRON TEMPERATURE		ION TEMPERATURE		
		± 10	± 20	AMOUNT	± 10	± 20
ARE1	4,939	3,650 74	4,437 90	4,898	3,429 70	4,491 90
ARE2	3,752	2,664 71	3,205 85	3,551	2,768 78	3,255 92
JIC	17,740	12,734 71	15,819 88	6,852	5,002 73	6,304 92
MH	2,500	1,250 50	1,975 79	2,470	1,754 71	2,297 93
AEROS	6,443	4,317 67	5,404 84	19,149	12,947 65	16,152 84
TOTAL	35,574	24,615 69	30,840 80	36,920	25,400 69	32,499 88

Besides these corrections and additions of new dependencies in the course of new data there should be refinement of the given latitudinal, height and time variations. The auroral feature needs further investigation.

Acknowledgements

We are indebted to the World Data Center A in Boulder for supplying us with the incoherent scatter tapes. The AEROS-RPA data were kindly given to our disposal by K. Spennner.

1.4 D-region Positive Ion Concentrations

by

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Rocket measurements of positive ion composition at several geographic locations and under different D-region conditions have invariably shown the presence of oxonium ions of the type $H^+(H_2O)_n$, $n = 1, 2, 3$ etc. There is a sharply defined cluster cutoff level above which the positive ion species are the molecular ions NO^+ and O^+ . The height of this level is around 82 km for the mid-latitude quiet D-region and this level is either raised or lowered depending on reduced or enhanced D-region ionization. It is now known [Reid, 1977], that the transition from the predominantly cluster ions below the cluster cutoff level to molecular ions above it, is due to (a) strong temperature dependence of the clustering reactions for the conversion of the precursor NO^+ ions to its hydrates and (b) the relative life time of the precursor ions for recombination with electrons compared to that for the formation of cluster ions. In this regard the role of minor neutral constituents such as atomic oxygen in the switching reaction chain would be important under disturbed conditions such as PCA or solar X-ray events where the majority of the primary ions happen to be O_2^+ .

A comparison of the partial concentrations of the D-region positive ions obtained from different rocket flights would not be realistic because of (a) the destruction of heavier cluster ions due to thermal breakup during rocket sampling and (b) the cluster cutoff level which depends on the seasonally varying mesospheric temperature and D-region ionization conditions. On the other hand, height variation of the relative concentration of cluster ions (with respect to total positive ions or molecular ions) can be used as an indicator of D-region conditions. Defining $[Z^+]$ as the total cluster ion density and $N^+ = [NO^+] + [O_2^+] + [Z^+]$ as the total positive ion density, the relative concentration of cluster ions is $[Z^+]/N^+$ or $f^+ = [Z^+]/([NO^+] + [O_2^+])$. These quantities are shown in Fig. 1 for different D-region conditions at equatorial and middle latitudes. In all these graphs $([Z^+]/N^+) \approx f^+$ above the cluster cutoff level where $N^+ \approx [O_2^+] + [NO^+]$. The graphs of Fig. 1 show that

- (1) For normal D-region conditions, cluster cutoff level is higher for summer than for other seasons (curves 2, 3 and 4),
- (2) Enhanced D-region ionization lowers the cluster cutoff level (curves 1, 5 and 6).

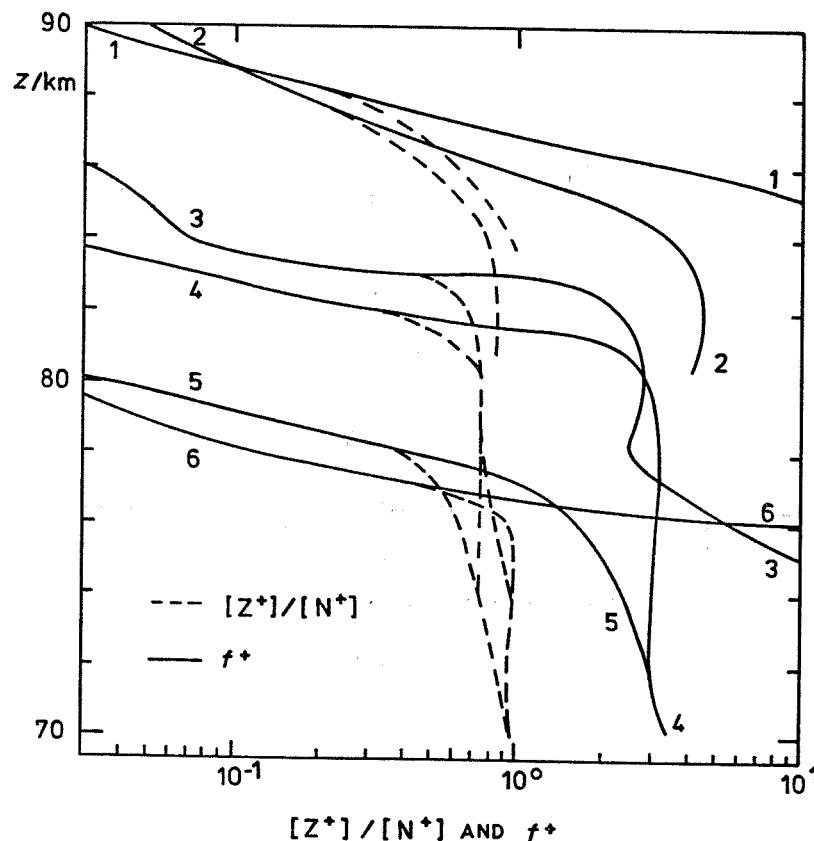


Fig. 1. Cluster cutoff level.

These conclusions are valid for the high latitude stations also as seen from Fig. 2. Although D-region ionization enhancement due to particle precipitation is a common feature at high latitudes, there was no indication of enhanced particle ionization for summer rocket data of Aug. 10, 1970 [KRANKOWSKY et al., 1972]. Compared to this, there was a mild particle precipitation event in progress during the rocket flight of Aug. 8, 1971, and the rocket encountered increased D-region ionization during the downleg trajectory compared to upleg flight [JOHANNESSEN and KRANKOWSKY, 1972]. Thus the general nature of the variation in the height of cluster cutoff level with D-region conditions is evident from rocket data for different latitudes.

More experimental data covering latitudinal and seasonal variations under different D-region conditions would be necessary to formulate any empirical relation for the height variation of D-region positive ion concentrations.

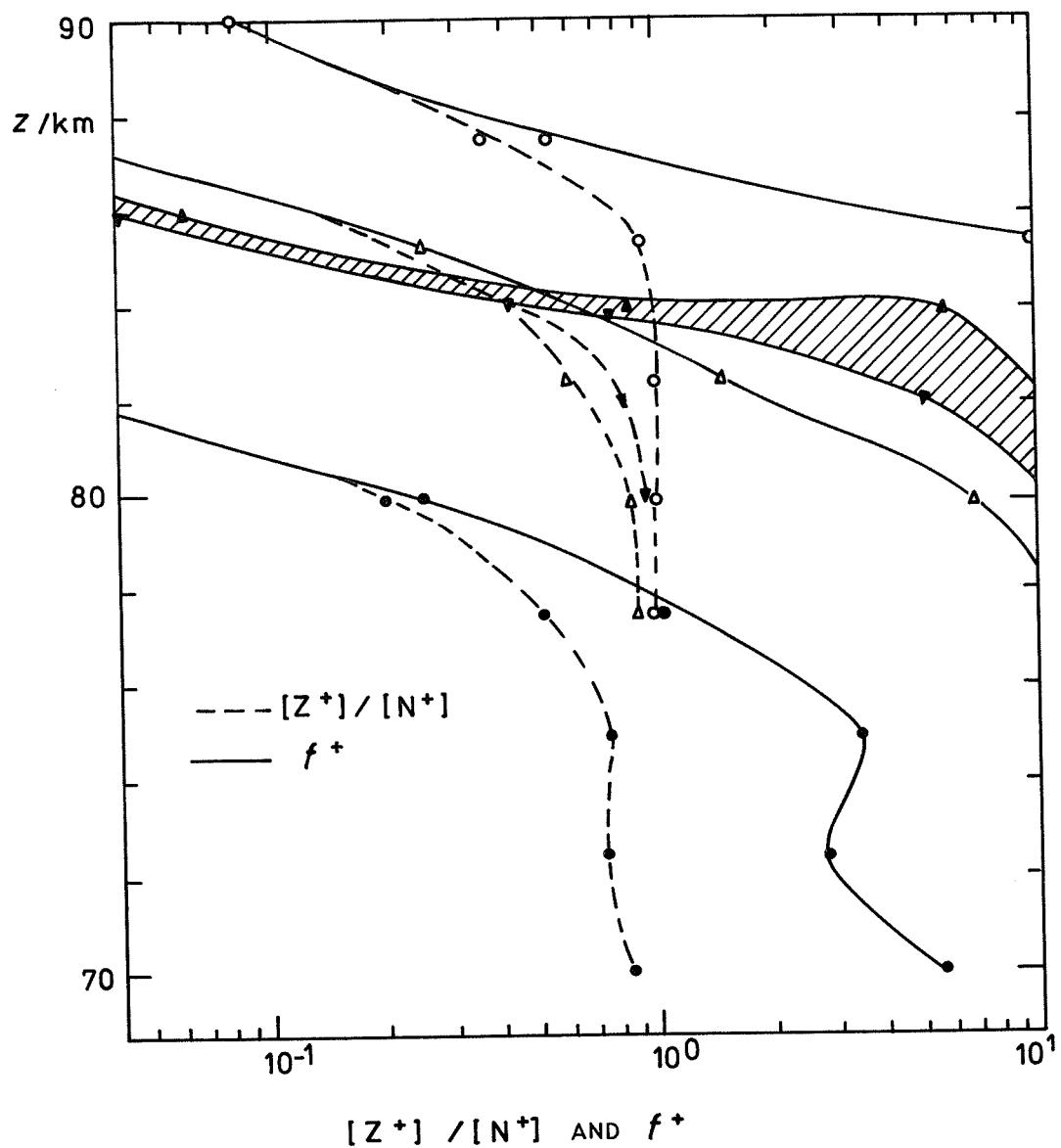


Fig. 2. Cluster cutoff level for high latitudes.

1.5 Structure and Composition of the Middle Atmosphere Ionized Component

by

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Abstract

Our current understanding of the structure and composition of the middle atmosphere ionized component (MAIC) and underlying processes is briefly reviewed. Problems associated with the definition of a reference-MAIC are discussed. It is concluded that a reference-MAIC of reasonably good precision cannot be defined at present since the observational data available are insufficient. A major complication results from the strong coupling of charged species to the thermal structure and dynamics of the neutral atmosphere which are poorly known.

Introduction

The ionized component of the Earth's middle atmosphere (20-100 km altitude; hereafter: MAIC) is much less explored than the major part of the ionosphere located above, mainly because of the higher gas pressures which complicate both processes involving charged species and in-situ measurements. Although our understanding of the MAIC is far from being satisfactory, considerable progress has been made in recent years. As far as the lower ionosphere (65-100 km) is concerned we are approaching an understanding of the most important processes controlling charged species. However, as will be shown in the following, we are not yet in a position allowing us to develop a quantitative model of this region. Concerning the ionized component of the stratosphere our knowledge is very limited and a more intense era of exploration has just begun.

The purpose of this article is to briefly summarize the present knowledge of the composition of the MAIC and to point out both those areas in which progress has been made and which are still uncertain.

Lower Ionosphere

The lower ionosphere is characterized by a steep increase of charged particle concentrations with height and by the presence of free electrons (Fig. 1). It exhibits strong temporal and spatial variations concerning both the total densities as well as the composition of charged particles. These variations, in particular, those occurring in the ionospheric D region (65-85 km altitude) have a strong component which cannot be related to changes of solar radiations.

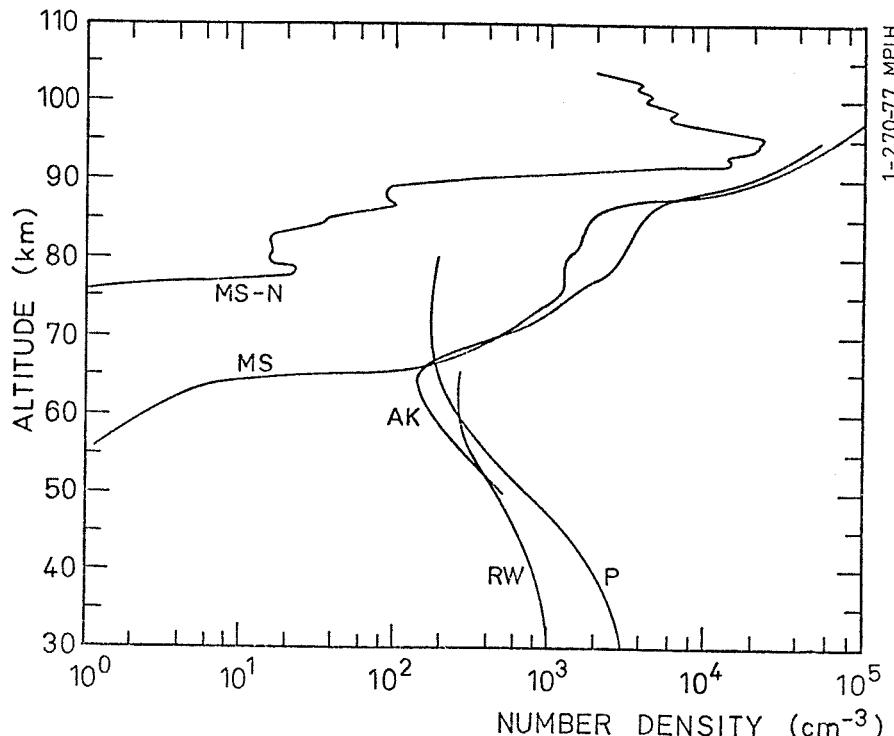


Fig. 1. Number densities of electrons during day (MS) and night (MS-N) from MECHTLY and SMITH [1970]. Number densities of positive ions during day (AK, P, RW) from ARNOLD and KRANKOWSKY [unpublished] (AK); PEDERSEN [1966] (P); ROSE and WIDDEL [1972] (RW).

In the following our current understanding of the processes controlling the structure, composition and morphology of the lower ionosphere will be summarized.

The most important sources of ionization are shown in Fig. 2. In the lower E-region (85-100 km altitude) solar extreme ultraviolet, Ly- β and x-radiations contribute most. As these radiations which are able to ionize major atmospheric gases (N_2 and/or O_2) become heavily absorbed above about 85 km, a strong dependence on the solar elevation is introduced. This results in seasonal, diurnal and latitudinal variations of the lower E region [KENESHEA et al., 1970].

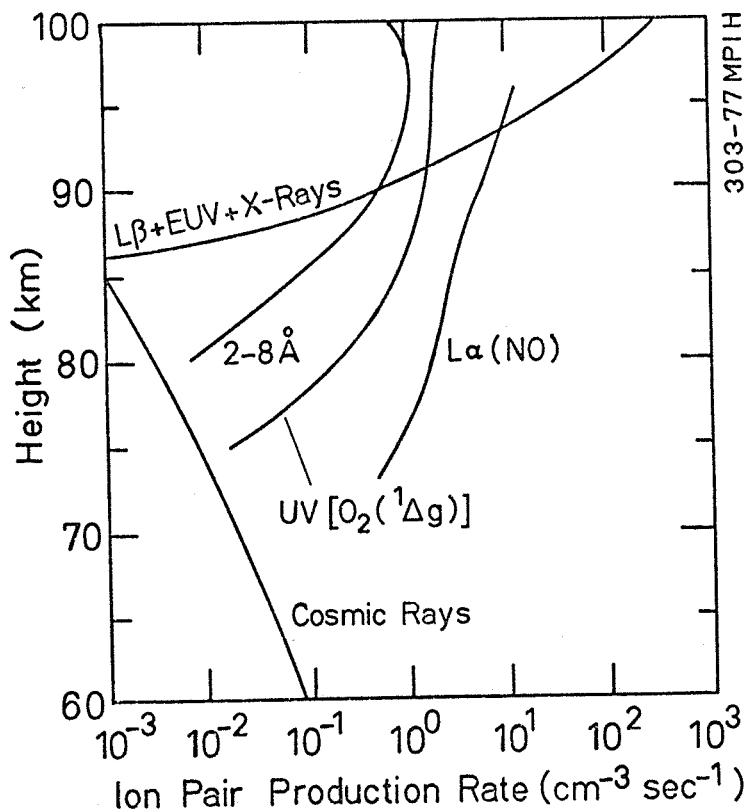


Fig. 2. Rates for the most important daytime ionization sources of the middle atmosphere [after THOMAS, 1971].

The most abundant charged species are free electrons and positive molecular ions, namely NO^+ and O^+ among which NO^+ is a secondary ion formed primarily by ion molecule reactions [ARNOLD and KRANKOWSKY, 1977]. Atomic metal ions (mainly Mg^+ and Fe^+) whose total fractional abundance undergoes considerable temporal and spatial variations may also become quite abundant. They are formed mainly by charge transfer reactions involving molecular ions and neutral metal atoms which result from meteor ablation [FERGUSON and FEHSENFELD, 1968]. Two examples of daytime lower ionosphere positive ion composition measurements during summer and winter are shown in Figs. 3 and 4. Since atomic ions recombine only very slowly with electrons by radiative recombination (see Table 1), they are long-lived and thus may reach high abundances. In contrast to the molecular ions they may also be transported downward from the upper into the lower E region by the combined action of the Earth's magnetic field and horizontal winds [CHIMONAS and Axford, 1968]. At night, when the ionization rates are drastically reduced, the atomic metal ions may become even dominant as the short-lived molecular ions are destroyed by recombination.

While the formation, chemistry and recombination of lower E-region molecular ions can be quantitatively modelled with a certain accuracy, the formation rate and transport of atomic metal ions are only poorly known. Therefore, a complete model of the lower E-region structure and composition cannot be formulated at present.

In the D region the situation is much more complicated as will be shown. The most important sources of ionization are photoionization of the trace gases NO and $O_2(1\Delta g)$ (Fig. 2) whose concentrations are variable in time and space. This is particularly true for NO which is photodissociated, but not significantly produced in the D region into which it is transported from its source regions, the lower thermosphere and the stratosphere. Moreover, horizontal NO -transport also plays an important role as the auroral oval represents an important additional NO -source [CRAVENS and STEWART, 1978; SWIDER, 1978]. Since both the vertical and horizontal transport and the auroral source are only poorly known, D-region ionization rates cannot at present be theoretically modelled with a satisfactory precision.

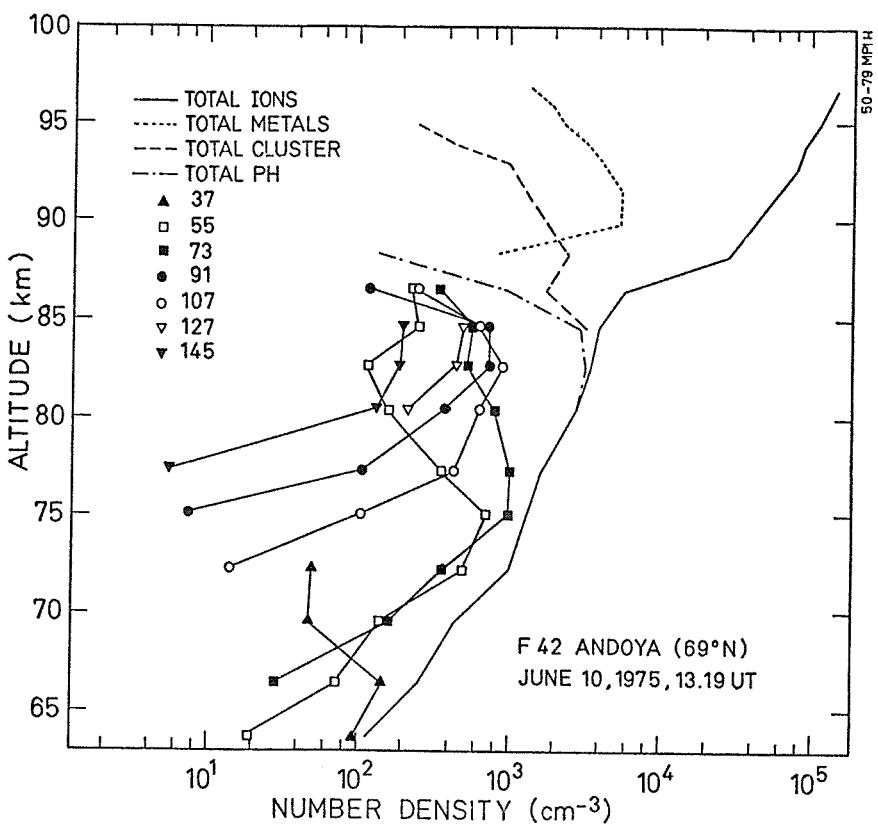


Fig. 3. Composition measurement of positive ions conducted at high latitudes during summer [from ARNOLD and KRANKOWSKY, 1977; ARNOLD and JOOS, 1979].

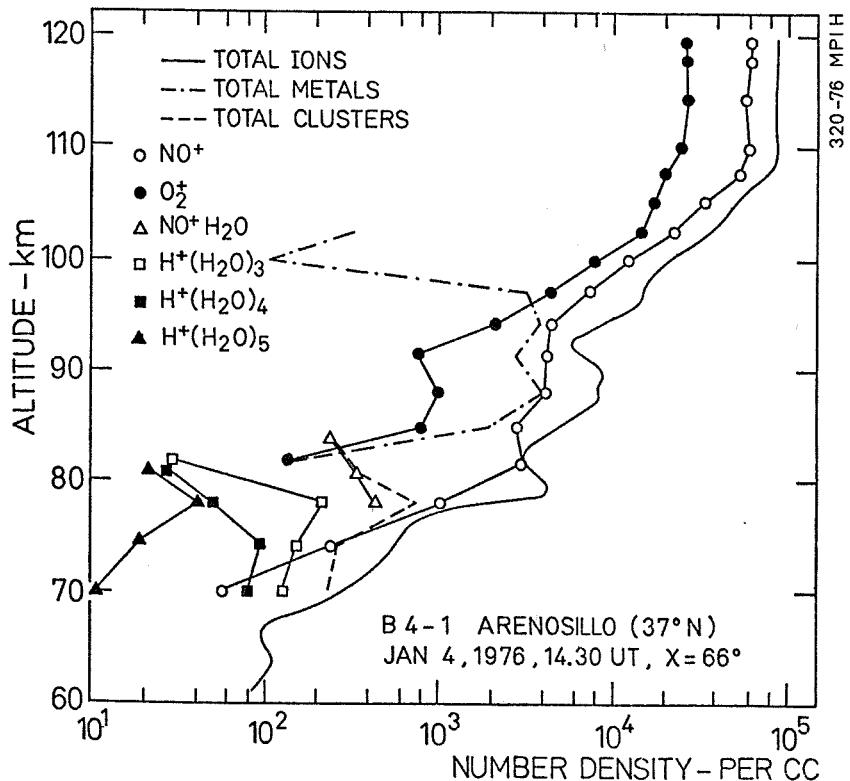


Fig. 4. Composition measurement of positive ions conducted at middle latitudes during winter [from ARNOLD and KRANKOWSKY, 1977].

The loss of charged particles in the D region is far more complicated than in the lower E region. Free electrons may be lost not only by recombination but also by attachment mainly to oxygen molecules [FERGUSON, 1974], which is the much faster process. Associative electron detachment from O_2^- by oxygen atoms, however, prevents O_2^- -formation to become efficient in the daytime D region. The lower boundary of the electron regime is located at the height where reactions converting O^- to more stable negative ions start to dominate the O^- -loss. Most important among these are O_2 -clustering and an O_3 -reaction [FERGUSON, 1974]. Thus, at night when atomic oxygen concentrations decrease steeply below about 75-80 km, the boundary is very sharp and is located in this height range. By day when atomic oxygen is present throughout the D region, the electron-boundary is located around 65 to 70 km. Below this boundary negative ions are the dominant negatively charged species as can be seen from a compilation of measured ratios of total negative and total positive ion concentrations (Fig. 5). The variability of the electron-boundary may be due to not only variations of O and O_3 concentrations, but also of temperature which controls O_2^- -clustering. These influences are not sufficiently well known to model the boundary accurately.

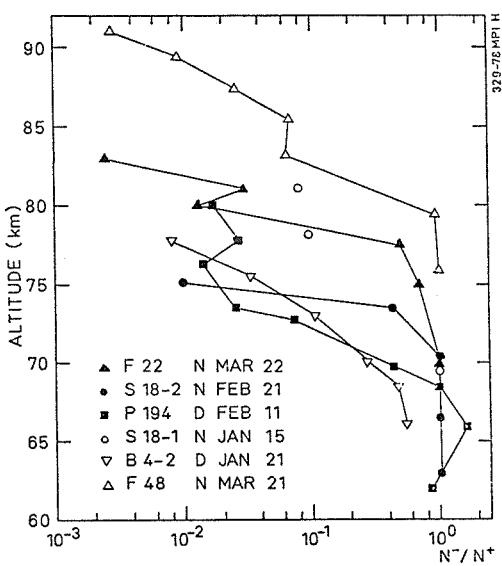


Fig. 5. Ratios of total negative and total positive ion concentrations as measured by rocket-borne ion mass spectrometers by day (D) and night (N). After ARNOLD and KRANKOWSKY [1977] and unpublished manuscript, 1979.]

Concerning the composition of negative ions only few measurements exist which differ considerably from each other [ARNOLD et al., 1971; NARCISSI et al., 1971, 1972a,b]. At present, it is unclear if these differences are real or instrumental. An example of a negative ion composition measurement is shown in Fig. 6. As can be noted, the negative ion regime (below 78 km) is dominated by molecular (mostly CO_3^- , HCO_3^- , and NO_3^-) and atomic (mostly Cl^-) ions. Very massive ions, probably cluster ions, dominate only in a narrow region around 80-84 km. Because of the scarce and controversial data no reference for the negative ion composition can be defined at present.

The primary positive D-region ions NO_3^+ and O^+ are lost not only by recombination with free electrons or negative ions, but also by ion-molecule (mainly clustering) reactions which ultimately lead to proton hydrates ($H^+(H_2O)_n$). As this conversion of molecular-to-cluster ions not only involves trace gases, but also depends very sensitively on temperature, a strong coupling of charged species to the photochemistry, dynamics and thermal structure of the mesosphere is introduced. The temperature influence is most pronounced for the conversion of NO_3^+ , the major D-region molecular ion [ARNOLD et al., 1980]. The time constant for the NO_3^+ -conversion increases with temperature by a factor of about 10,000 in the range of D-region temperatures (Fig. 7). Moreover, it is inversely proportional to the square of the total gas number density. Consequently, the fractional abundance of positive cluster ions decreases steeply with height and undergoes strong temporal and spatial variations which are associated with corresponding temperature fluctuations. The upper boundary of the positive cluster ion regime which is defined by the equality of the NO_3^+ -conversion time constant and the cluster ion lifetime against recombination may vary between about 70 and 95 km altitude mainly depending on temperature (Fig. 8). At night, the cluster ion boundary is around 90-95 km on the average for summer and winter. At day, it is for average conditions around 87 km in summer and around 80 km in winter. Its variability associated with typical temperature fluctuations ($\pm 20^\circ$) is relatively weak in summer (86-88 km) and very pronounced in winter (71-88 km). As temperature variations appear to be stronger in winter when deviations by $\pm 40^\circ$ have been observed quite often [SCHMIDLIN, 1976], the boundary may then vary between about 70 and 90 km. A lower limit for the cluster ion boundary is defined by the lower boundary of the electron regime. As negative ions recombine with positive cluster ions much more slowly (Table 1), the cluster ion boundary, therefore, should not descend below 80-85 km at night and 70-65 km at day even for very high temperatures.

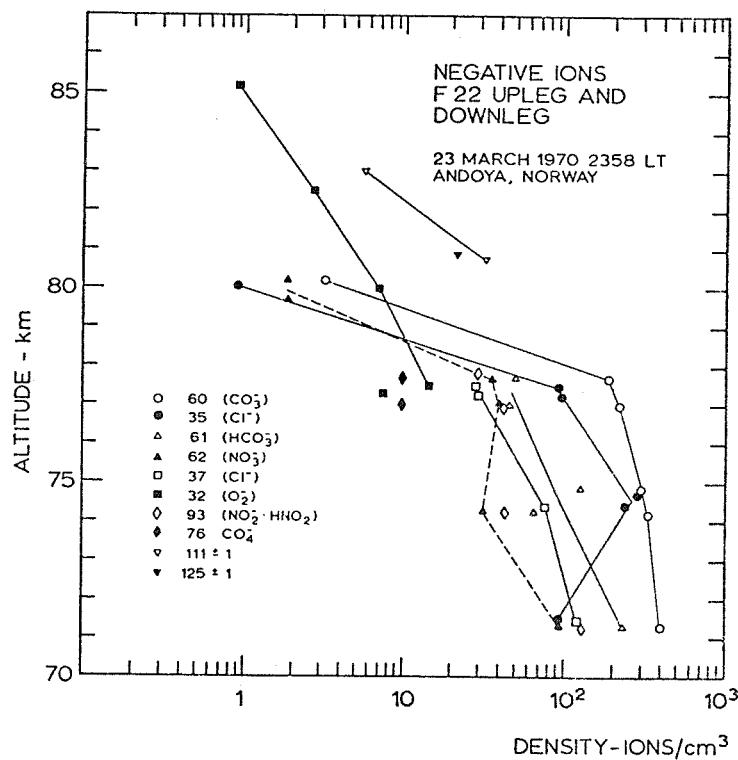


Fig. 6. Composition measurement of negative ions conducted at night and at high latitudes [from ARNOLD and KRANKOWSKY, 1977].

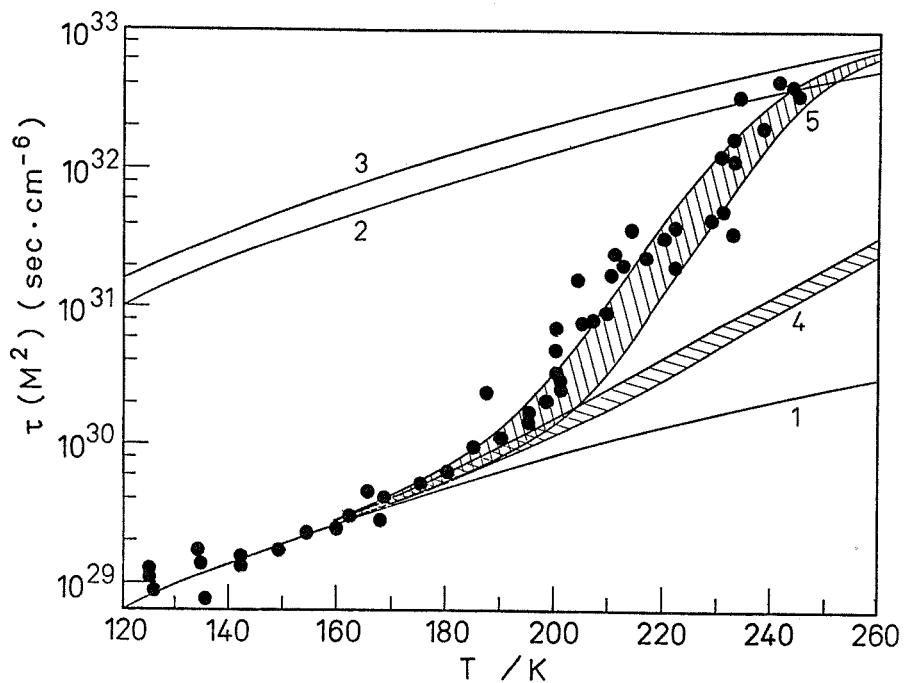


Fig. 7. Effective time constants τ for the conversion of NO^+ to cluster ions and $\tau |M|^2$ as a function of temperature. $[M]$ denotes the total gas density. Effective time constants τ for a fixed ($[M] = 2 \cdot 10^{20} \text{ m}^{-3}$) corresponding to a height around 85 km are indicated on the right hand ordinate. Theoretical $|M|^2$ values for N_2^{2-} , CO_2^{2-} , and H_2O -clustering (curves 1, 2, and 3) are also given. Theoretical $\tau |M|^2$ values considering thermal decomposition of NO^+N_2 (curve 4), of NO^+N_2 and NO^+CO_2 (curve 5), and of N_2 switching of NO^+CO_2 (curve 6) in addition are also given [from ARNOLD et al. 1980].

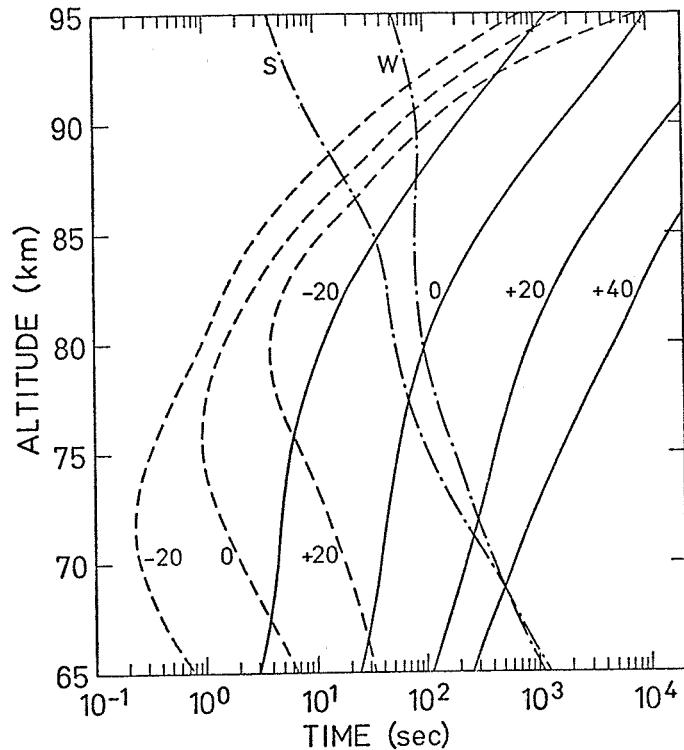


Fig. 8. Effective time constants for the NO^+ -conversion as a function of height for summer (broken curves) and winter (solid curves) at 50° latitude. Temperature deviations relative to CIRA [1972] temperatures are indicated. Time constants for recombination of cluster ions with electrons also given for summer (S), winter (W) [from ARNOLD et al. 1980].

Table 1. Recombination processes for positive and negative ions and electrons; reaction coefficients in fourth, sources in fifth column: (a) BATES et al. [1962]; (b) BIONDI [1969]; (c) HUANG et al. [1978]; (d,e) SMITH and CHURCH [1976].

Process	Educts	Products	Typical reaction coeff.	Reference
Radiative R.	$A^+ + e^-$	$A + h\nu$	$10^{-17} \text{ m}^3 \text{ s}^{-1}$	(a)
Dissociative R.	$AB^+ + e^-$	$A + B$	$5 \cdot 10^{-13}(T/300\text{K})^{-1} \text{ m}^3 \text{ s}^{-1}$	(b)
Electron R. of complex ions	$A^+(B)_n + e^-$		$\leq 5 \cdot 10^{-12} \text{ m}^3 \text{ s}^{-1}$	(c)
Ion-Ion R. (2-body)	$A^- + B^+$		$5 \cdot 10^{-14}(T/300\text{K})^{-1/2} \text{ m}^3 \text{ s}^{-1}$	(d)
Ion-Ion R. (3-body)	$A^- + B^+ + M$		$2 \cdot 10^{-37}(T/300\text{K})^{-5/2} \text{ m}^6 \text{ s}^{-1}$	(e)

As cluster ions recombine much faster with free electrons than do molecular ions (Table 1), total charged particle concentrations are for a given ionization rate significantly smaller at heights where positive cluster ions and free electrons are the dominant charged species. Thus, the cluster ion boundary is usually accompanied by a ledge in the total positive ion- and electron concentration profiles (see Figs. 4 and 5). In summer the ledge merges with the bottom of the E layer (Fig. 4). In winter when the bottom of the E layer due to the lower solar elevation is above 90 km and the cluster ion boundary due to the higher temperature is around 80 km the ledge can be clearly identified.

Considering the strong temperature influence, modelling of the D region is complicated as the thermal structure of the mesosphere which undergoes not only systematic (seasonal and latitudinal) but also pronounced irregular variations, is not sufficiently well known.

In summarizing the above discussion it may be concluded that there are two major obstacles which at present seriously complicate modelling of the D-region structure and composition. They are our poor knowledge of NO-concentrations which mainly control the ionization rates and which depend sensitively on mesospheric dynamics and our poor knowledge of the thermal structure of the mesosphere which determines the loss rates of charged particles through controlling the conversion of molecular ions to rapidly recombining cluster ions. The situation may be improved as far as modelling of systematic trends is concerned in the near future when global mapping of mesospheric NO-concentrations and temperatures by satellite observations will hopefully become available. Considering, however, the strong short term and regional fluctuations of the D region induced by corresponding changes of the thermal and dynamical structure or in other words the "meteorology" of the mesosphere, the chances for defining a reasonably precise reference D region will probably remain low.

Stratospheric Ionized Component

The ionized component of the stratosphere above 20 km altitude is characterized by a decrease of charged particle concentrations with height and by an absence of free electrons (Fig. 1). Measured charged particle concentration profiles show marked variations by factors up to at least 10 [HALE et al., 1968; HALE et al., 1972; ROSE and WIDDEL, 1972]. To which extent the variations are real is unclear at present.

Galactic cosmic radiation represents the most important source of ionization (Fig. 2) and is able to ionize all gases. It suffers from no significant mass absorption in the height region of interest which implies the ionization rate to be proportional to the total gas number density. Since the galactic cosmic radiation is influenced by the Earth and the interplanetary magnetic fields, the ionization rates vary with geomagnetic latitude and solar activity [WEBBER, 1962] being high for high geomagnetic latitudes and low solar activity.

Concerning the nature and composition of charged species very little is known. Crude information on ion masses obtained from in situ ion mobility measurements [ROSE and WIDDEL, 1972; MITCHELL et al., 1977; ISHIKAWA et al., 1969; GRAS, 1975] indicate "small ions" to be dominant. First information on the chemical nature and composition of positive ions became available only recently from rocket- [ARNOLD et al., 1977a] and balloon- [ARNOLD et al., 1977b; OLSEN et al., 1977; ARIJS et al., 1978; ARNOLD et al., 1978] borne mass spectrometer measurements. The latter also provided first information on negative ions [ARNOLD and HENSCHEN, 1978]. From these measurements it appears that both positive and negative ions are massive and rather complex cluster ions whose identification is not yet certain and awaits supporting laboratory studies of relevant ion-molecule reactions.

Preliminary identifications suggest positive core ions to be mostly protonated H₂O and x (unidentified molecule having a mass of 41+1 amu) to which neutral molecules mostly H₂O and x are attached. Negative core ions appear to be mostly NO₃⁻ and R⁻ (tentatively identified as HSO⁻) to which neutral molecules mostly acids (HNO₃ and HR which was tentatively identified as H₂SO₄) are attached [ARNOLD et al., 1978; ARNOLD and HENSCHEN, 1978].

Considering the early stage of exploration of this region no reference for the ion composition can be given at present. Whether total charged particle concentrations can be accurately modelled is not certain. While the ionization rates can be modelled reasonably well, little is known about the ion loss processes. In particular, it is unclear to which extent they may eventually depend on temperature and on the ion composition which, in turn, should be controlled by trace gases and temperature.

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University, Library D7800 Freiburg, West Germany.

2. TECHNICAL NOTE CONCERNING THE MAIN PROGRAMS

IRIAL 7 and IRIFO 7

In order to use one of these programs, the user has to take the following steps:

- 0.1 Procure CCIR input data tape to be read in equivalent of procedure CCIRCA. This tape is a special version of the official "CCIR-map" containing only the numerical coefficient sets for FOF2 and M3000. It is available in code ASCII(2) or in EBCDIC(1) at WDC-A (STP).
- 0.2 If such tape is not at hand replace procedure F2OUT by IONDEM (p.250) and change the relevant call-in. This means you use program IRIAL7A or IRIFO7A.
1. Adjust to your computing facility:
 - 1.1 Identify by channel numbers of your facility
 - the input device EGNR for interactive input
 - the output device KONSOL for interactive output
 - the output device AGNR for producing final tables
 - 1.2 Adapt procedure/subroutine CCIRCA which takes CCIR input data from the CCIR tape in its standard format for FOF2 and M(3000)F2. In ALGOL replace GETS by the name of your tape reading procedure, and adjust channel numbers. In FORTRAN insert reading subroutine of your computer, adapted to input code ASCII(2) or EBCDIC(1) whichever applies.
2. Start program.
3. Give following formated inputs via EGNR. (In parenthesis you will find the desired format for ALGOL and FORTRAN.)
 - 3.1 Specify location solar activity and time by: Latitude LATI, longitude LONGI (all: +ZZD/F6.1), sunspot number R (ZZD/F6.1), MONTH (ZD/F4.1), HOUR (ZD.D/F4.1), the latter to be inserted as local mean time (LMT). The small shift due to the equation of time is not taken into account but the longitude of the place must be accounted for when going from LMT to a legal hour.
 - 3.2 In the special condition when you like to consider a fixed solar zenith angle, then specify this numerical value XHI/degree (ZD.D/F4.1). In doing so you shall get upper ionosphere parameters according to the value of HOUR, but those of the lower layers according to that of XHI. Both are only coherent if your indications of HOUR and XHI were consistent. Normal use is to put -10.0 for XHI, then the zenith angle is computed in the program itself.
 - 3.3 Specify profile range by lower limit AH, upper limit EH and step-width SH in km (all: B, 32D.D/1X, F6.1). The program stops after 50 height values, i.e. at AH = 49 . SH.
 - 3.4 Specify format for results by inserting for KOBE: (B, D/1X, 11). 0 for printer, 1 for other output devices.
 - 3.5 All of the admitted plasma parameters are printed. There are 10 parameters. The parameters are (decision symbol): electron density (JNE); same but relative to maximum F2-density (JNEMAX); neutral temperature (JTN); electron temperature (JTE); ion temperature (JTI); temperature ratio (JTETI); relative ion densities in percent:
O⁺ (J0), H⁺ and He⁺ (JHHE), O₂⁺ (J0₂), NO⁺ (JNO).
 - 3.6 Specify decision symbol JMAG (D/I1). If input coordinates (in 3.1.1) are geomagnetic then JMAG = 1, if they are geographic then JMAG = 0.
 - 3.7 Insertion of peak values (two choices):
 - 3.7.1 Choice 1: Use CCIR values; enter 0 for HMF2 and FOF2.
 - 3.7.2 Choice 2: Direct acquisition of peak data through input device (KONSOL). Give peak values HMF2 in km and FOF2 in MHz.
4. Computer works, results are stored.
5. Computer gives results out in the following order:
 - 5.1 The input values specified in 3.4 and 3.1. If JMAG = 1 then MLAT, MLONG else LATI, LONGI; further R, MONTH, HOUR, XHI.
 - 5.2 Characteristic values computed from these: if JMAG = 1 then LATI, LONGI else MLAT, MLONG; further DIP, MODIP, magnetic latitude MAGLA, solar zenith angle XHI, local sunrise, sunset and solar declination angle.
 - 5.3 Peak values of the four layers: NMF2, NMF1, NME, NMD (in m⁻³); HMF2, HMF1, HME, HMD (in km).
 - 5.4 The desired profiles (parameters as selected in 3.3).

6. An example is documented in the following:
 - 6.1 Inputs via console (st. 89...113 (odd) of FORTRAN program answers questions specified in st. 88...112 (even)).
 - 6.1.1 Inputs after 3.1: location (42.6°S, 288.5°E), solar activity ($R = 70$) and time (June, 12h): - 42.6 + 288.50700612.0 (- 42.6+288.5 70 612.0 is also accepted).
 - 6.1.2 For normal use of program write -10.0 as input after 3.2 for XHI. (Then XHI is automatically computed.)
 - 6.1.3 Inputs after 3.3 determining height format:
80.0 800.0 20.0
 - 6.1.4 Input KOBE (answering 3.4): 0
 - 6.1.5 Input JMAF after 3.6, specifying coordinates to be geographic: 0
total input (st. 532)
- 42.6+288.5 70 612.0 -10.0
80.0 800.0 20.0 0
- 6.2 In case, choice 3 in 3.7 is chosen to be applied, i.e. when peak data are available directly (3.7.3):
 $HMF2 = 264.5 \text{ km}$
 $NMF2 = 5.2310^{+11} \text{ x}^{-3} : 264.5 \quad 5.23010^{+11}$
- 6.3 Many examples can be found in Sect. 4.1. Inputs concerning location, activity and time are specified in the top line of each table. The following 5 lines give values which were computed when running the program. Hereafter follows the main profile table.

3. FORMULAS

ELECTRON DENSITY PROFILE

(1) upper F-region

$HMF2 \leq h \leq 1000 \text{ km}$

$$NE1(h) = NMF2 \cdot \exp(-Y)$$

$$Y = \frac{1000-HMF2}{700} \cdot (\beta \cdot n \cdot \ln \frac{1+\exp((X-394.5)/\beta)}{1+\exp((-94.5-\delta)/\beta)} +$$

$$+\zeta \cdot (100 \cdot \ln \frac{1+\exp((X-300)/100)}{1+\exp(-\delta/100)} - X+300-\delta))$$

$$X = \frac{h-HMF2}{1000-HMF2} \cdot 700+300-\delta$$

$$\delta = (n/(1+z) - \zeta/2) / (n \cdot z / (\beta \cdot (1+z)^2) + \zeta/400)$$

$$z = \exp \frac{94.45}{\beta}$$

ζ, β and n are functions of

geomagnetic latitude ϕ ($z_1 = \cos^2 \phi$),

solar radio flux COV ($z_2 = (\text{COV}-40)/30$) and

peak plasma frequency ($z_3 = f_{\text{OF}}/2$).

$$f(z_1, z_2, z_3) = a_1 + a_2 \cdot z_1 + a_3 \cdot z_2 + a_4 \cdot z_1 \cdot z_2 +$$

$$(a_5 + a_6 \cdot z_1 + a_7 \cdot z_3) \cdot z_3$$

The numerical coefficients are contained in the program.

(2) bottomside F2-region

$HMF1 \leq h < HMF2$

$$N(h) = NMF2 \cdot \frac{\exp(-x^{B_1})}{\cosh(x)}$$

$$x = \frac{HMF2-h}{B_O} \quad B_1 = 3$$

(e.g. B_O) are taken from experimental evidence at specific conditions and are interpolated with EPSTEIN functions in local time (steps at sunrise and sunset) and in latitude (30°). For the dependence on solar activity a linear interpolation is used.

$$B_O (45^\circ) \text{ from BECKER (1972)} \quad (i)$$

$$B_O (18^\circ) \text{ from Mexico composite profiles, NOAA}$$

(3) F1-region (day only)

$\text{Hz} \leq h < HMF1$

$$N(h) = N^{(2)}(h) + NMF2 \cdot C_1 \cdot \sqrt{\frac{HMF1-h}{B_O}}$$

$$C_1 = 0.1244 - 4.44\% - 4 \cdot R + \frac{0.09}{1 + \exp(-\frac{|\text{MODIP}| - 30}{10})}$$

NMF1 as predicted by EYFRIG et al. (1972)

HMF1 is the height at which the function $N^{(2)}(h)$ becomes equal to NMF1

(i) Latitude, hour and activity interpolated with IPOL (XPOL)

(4) intermediate region $HEF \leq h < Hz$

$$N(h) = N^{(3)}(\bar{h})$$

$$A = (\frac{STR}{HST} - 1) \cdot (H - Hz) / (HEF - Hz) + 1$$

$$\bar{h} = A \cdot (Hz + T/2 - sign(T) \cdot \sqrt{T \cdot (Hz - h + T/4)})$$

$$T = D \cdot D / (Hz - HEF - D)$$

HST is the height at which the function $N^{(3)}(h)$ becomes equal to NME

$$Hz = (HST + HMF1) / 2$$

$$D = Hz - HST$$

$$HEF = HME + HBR$$

(5) E-valley region $HME \leq h < HEF$

$$N(h) = \begin{cases} NME \cdot (1+P) & \text{by day} \\ NME \cdot \exp(P) & \text{at night} \end{cases}$$

$$P = E_1 \cdot x^2 + E_2 \cdot x^3 + E_3 \cdot x^4 + E_4 \cdot x^5$$

$$x = h - HME$$

E_1 to E_4 are calculated from the following parameters defining the valley:

NHABR is the difference between HME and the height, where the minimum density of the valley occurs (ii).

HBR is the difference between HME and the height, where the electron density in the valley again increases to NME (ii).

NDEL is the percentage depth of the valley (ii).

DNDHBR is the height derivative at HME + HBR of the logarithm of the electron density (ii).

The above parameters for midlatitude and midday were taken from Malvern incoherent scatter data and those for midnight from MAEDA (1971).

Low latitude daytime profiles have no valley in the E-region.

NME from equation given in Doc. 6/3/07 (Sept.73) of CCIR IWP 6/3 (presented by KOURIS and MUGGLETON),

HME from K-1. MAEDA's (1971) E-region profile (ii).

HME = 110 for day and 105 for night.

(6) D-region $HA \leq h < HME$

$$N(h) = \begin{cases} NME \cdot \exp(-D1 \cdot (HME - h)^K) & h > HDX \\ NMD \cdot \exp(FP_1 \cdot x + FP_2 \cdot x^2 + FP_3 \cdot x^3) & h \leq HDX \end{cases}$$

$$x = h - HMD$$

NMD and HMD (ii) are the density and height of the inflection point in the D-region profile. NMD is computed with procedure NMDED (XMDED).

$$FP_1 = F_1$$

$$FP_2 = -F_1 \cdot F_1 / 2$$

$$FP_3 = \begin{cases} (-F_2 \cdot FP_2 - FP_1 + 1/F_2) / (F_2 \cdot F_2) & h > HMD \\ (-F_3 \cdot FP_2 - FP_1 - 1/F_3) / (F_3 \cdot F_3) & h \leq HMD \end{cases}$$

(ii) Hour interpolated with HPOL (HPOL)

$$HDX = HMD + F_2$$

$$HA = \begin{cases} 65 \text{ km by day} \\ 80 \text{ km at night} \end{cases} \quad \text{deepest height}$$

Continuity of $N(h)$ and its derivative dN/dh at $h=HDX$
(NDX,DNDX) gives

$$K = -DNDX \cdot (HME-HDX) / (NDX \cdot LN(NDX/NME))$$

$$D_1 = DNDX / (NDX \cdot K(HME-HDX)^{K-1})$$

The input parameters F_1 , F_2 , F_3 (ii) have the meaning:

$$F_1 = \frac{d(\ln N)}{dh} (h=HMD)$$

F_2 (or F_3) is the difference between HMD and the height
where the electron density increases (decreases)
to $NMD \cdot e$ (NMD/e).

NMD , HMD , F_1 , F_2 and F_3 derived from DICKINSON et al.
(1976), MAEDA (1971), MECHTLY and BILITZA (1974),
PRAKASH et al. (1974) and GNANALINGAM (1978).

NEUTRAL TEMPERATURE PROFILE

We use the equations for deriving the exospheric temperature and the temperature profile $T_n(h)$ as specified in
CIRA 1972 (procedures TUNCAL and TN).

ELECTRON TEMPERATURE PROFILE

(1) upper F-region

$$H_o \leq h \leq 1000 \text{ km}$$

$$T_e(h, \phi) = f_1(\phi) + f_2(\phi, h) + f_4(h)$$

$$f_1(\phi) = a - b \cdot \frac{\cos X}{|\cos X|} \cdot |\cos X|^n$$

$$f_2(\phi, h) = c \cdot \frac{e^{-0.1 \cdot \phi}}{(1 + e^{-0.1 \cdot \phi})^2} \cdot \frac{e^{-0.03 \cdot (h - h_{max})}}{(1 + e^{-0.03 \cdot (h - h_{max})})^2}$$

$$f_4(h) = d \cdot (h - 700)$$

ϕ geomagnetic latitude / degree

$$X = a_1 + a_2 \cdot \phi^2$$

$$h_{max} = 70 \cdot \exp(-1.4 \cdot 10^{-3} \cdot \phi^2) + 200$$

	a	b	n	a_1	a_2	c	h_{max}	d
DAY	2325	725	1	3.4	-0.014	2.56 ₁₀ ⁴	250	2
NIGHT	1600	700	0.5	0.47	0.024	0	0	0

$$H_o = \begin{cases} 400 & \text{NIGHT} \\ 350 & \phi > 40^\circ \\ 200 & \phi \leq 40^\circ \end{cases} \text{ DAY}$$

Temperature values are interpolated in time between
midday and midnight with HPOL.

(2) Extrapolation to the bottomside HTA $\leq h < H_o$

$$HTA = 120 \text{ km} \quad T_{n_0}(HTA)$$

$$T_e(h) = T_{n_0}(h) + QU_0 \cdot (h - HTA)$$

$$QU_0 = \frac{T_e(H_o, \text{HOUR}) - T_{n_0}(H_o, \text{HOUR})}{H_o - HTA}$$

$T_e(H_o, \text{HOUR})$ is obtained by interpolation in time with HPOL (HPOL).

QUO is first computed for night, then for the desired time HOUR.

ION TEMPERATURE PROFILE

(1) upper region

$$HS \leq h \leq 1000 \text{ km}$$

$$T_i(h) = MM_0 \cdot (h - HS) = T_n(h) + \\ + \sum_{j=1}^2 (MM_j - MM_{j-1}) \cdot G_j \cdot \ln \frac{1 + \exp((h - XSM_j)/G_j)}{1 + \exp((HS - XSM_j)/G_j)}$$

$$G_1 = 20 \text{ km} \quad G_2 = 50 \text{ km}$$

HS is the height at which the tangent to the neutral profile $T_n(h)$ passes through $(XSM_1 // YSM_1)$

$$YSM_1(\phi) = \begin{cases} 1240 - 1400 \cdot \frac{e^{-0.09 \cdot \phi}}{(1 + e^{-0.09 \cdot \phi})^2} \text{ day} \\ 1200 - 300 \cdot \frac{\cos(X)}{|\cos(X)|} \cdot \sqrt{|\cos(X)|} \text{ night} \end{cases}$$

$$X = 0.47\phi + 0.024 \cdot \phi^2$$

$$MM_0 = \frac{dT_n}{dh}(h=HS)$$

$$MM_1 = \begin{cases} 3 \text{ day} \\ 0 \text{ night} \end{cases} \quad (\text{AEROS-B RPA-data})$$

$$MM_2 = \begin{cases} MM_3 & T_i(HEI) < T_e(HEI) \\ \frac{dT_e}{dh}(h=HEI) & T_i(HEI) \geq T_e(HEI) \end{cases} \quad HEI = 1000 \text{ km}$$

$$XSM_1 = 430 \text{ km} \quad (\text{from AEROS-B RPA-data})$$

$$XSM_2 = \begin{cases} XSM_1 & T_i(HEI) < T_e(HEI) \\ \frac{T_e(HEI) - 10 - YSM_2 + MM_1 \cdot XSM_1 - MM_2 \cdot HEI}{MM_1 - MM_2} & T_i(HEI) \geq T_e(HEI) \end{cases}$$

We interpolate in time with procedure HPOL.

(2) lower region

$$HTA \leq h < HS$$

$$T_i(h) = T_n(h)$$

ION RELATIVE PERCENTAGE DENSITY

(I) atomic oxygen positive ions

$$RDO(h) = \overbrace{RDO}^4 \exp(MO_0 \cdot (h-\hat{h})) + \\ + \sum_{i=1}^4 (MO_i - MO_{i-1}) \cdot DO_i \cdot \ln \frac{1+\exp((h-HO_i)/DO_i)}{1+\exp((\hat{h}-HO_i)/DO_i)}$$

$$DO_1 = 9 \text{ km } DO_2 = 5 \text{ km } DO_3 = 5 \text{ km } DO_4 = 50 \text{ km}$$

$$MO_0 = f(PG10_1, PG10_2, PG10_3, PG10_4)$$

$$MO_1 = f(PG10_5, PG10_6, PG10_7, PG10_8)$$

$$HO_1 = f(PG10_9, PG10_{10}, PG10_{11}, PG10_{12})$$

The array PG 10 is given in procedure KOEFP1

$$f(P_1 \dots P_4) = + (P_2 - P_1) / (1 + \exp(-(\cos(x) - P_4)/P_3))$$

x solar zenith angle, at night $\cos(x) = 0$

$$HO_4 = PG20_1 \quad MO_2 = 0 \quad MO_3 = PG20_2 \quad MO_4 = PG20_3$$

the array PG20 is given in procedure KEOF2

$$HO_2 = 237 \text{ for summer, COVI } \neq 140, \text{ else } 290$$

$$HO_3 = (\ln(100) - MO_4 \cdot (HO_4 - PG20_4)) / MO_3 + HO_4$$

The O^+ percentage is assumed to peak at altitude \hat{h}

where $RDO(\hat{h}) = \overbrace{RDO}^4$; we put $\overbrace{RDO}^4 = 98$ (higher values may be reached in nature)

$$\hat{h} = 249 \text{ for summer, COVI} = 140, \text{ else } 300.$$

(II) molecular oxygen positive ions

$$RD02(h) = \overbrace{RD02} \cdot \exp(MO2_0 \cdot (h-\overbrace{H0}^{\hat{h}})) +$$

$$+ \sum_{i=1}^2 (MO2_i - MO2_{i-1}) \cdot DO2_i \cdot \ln \frac{1+\exp((h-HO2_i)/DO2_i)}{1+\exp((\hat{h}-HO2_i)/DO2_i)}$$

$$DO2_1 = 5 \text{ km } DO2_2 = 5 \text{ km}$$

$$RD02(\overbrace{H0}^{\hat{h}}) = \overbrace{RD02} = 1\%$$

$$\overbrace{H0}^{\hat{h}} = PF30_1 + PF30_2 \cdot \cos x$$

$$HO2_1 = PF30_3 + PF30_4 \cdot \cos x$$

$$HO2_2 = PF30_5 + PF30_6 \cdot \cos x$$

$$MO2_0 = PF30_7 + PF30_8 \cdot \cos x$$

$$MO2_1 = PF30_9 + PF30_{10} \cdot \cos x$$

$$MO2_2 = PF30_{11} + PF30_{12} \cdot \cos x$$

$$RNO = (100 - RDO(\hat{h}) - RD02(\hat{h}))/RD02(\hat{h})$$

(III) nitric oxide positive ions

$$RDNO(h) = \begin{cases} RNO \cdot RN02(h) & \text{for } h \geq \hat{h} \\ 100 - RDO(h) - RD02(h) & \text{else} \end{cases}$$

We put RDNO = 0 when it is less than 0.0005

(IV) hydrogen positive ions

$$RDH(h) = \begin{cases} 0 & \text{for } h \leq \hat{h} \\ (100 - RD0(h) - (1 + RNO) \cdot RD02(h)) \cdot (1 - PEHE/100) & \text{otherwise} \end{cases}$$

PEHE is the percentage of He^+ against all light ions, namely H^+ and He^+ . In the absence of better information we use a constant estimated value of 10%.

(V) helium positive ions

$$RDHE(h) = RDH \cdot PEHE / (100 - PEHE)$$

4. EXAMPLES

4.1 Tables

Output tables computed with IRIAL 7 and the CCIR peak model are presented on the following pages for 108 combinations of input parameters. Six locations were chosen so as to provide some impression of the worldwide behavior of the ionosphere. These are, after geographic latitude, longitude and location:

42.6°N	44.1°N	35.7°N	14.7°N	120.0°S	51.7°S
288.5°E	2.0°E	140.0°E	342.6°E	283.1°E	302.2°E
Boston	St. Santin	Tokyo	Dakar	Lima	Stanley
USA	France	Japan	Senegal	Peru	Falkland

For each location two levels of solar activity are considered namely R (Zurich sunspot number) 10 and 100, further 3 months (March, June, December) and 3 hours (noon, sunrise, midnight). These indications can be found at the top of each table.

Results are given from 80 to 800 km with steps in altitude of 5 km up to 140 km, of 10 km up to 240 km and of 20 km to 800 km (first column). All 11 output parameters which can be chosen in the program are shown in successive columns in the following order:

absolute electron density - relative electron density - neutral temperature -electron temperature - ion temperature - ratio of electron to ion temperature -percentage of O^+ (and N^+) ions - percentage of H^+ ions - percentage of He^+ ions - percentage of O_2^+ ions - percentage of NO^+ ions.

INPUT: LATI= 42.6 LONGI= 288.5 R= 10 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DTP= 71.5 NEDIP= 55.5 HAGLA= 56.3 XHIF= 45.9
 SUNRSE: 6.2 L.T. SUNSET:17.8 L.T. SUN DEC.: -3.3
 NMF1=3.66%11 NMFL1= 2.09%11 NMME=1.16%11 NMD=5.31%08
 NMF2=2.37%7 NMFL2=185.2 NMME=110.0 NMD= 81.0

H	NE	N/NMAX	TH	TE	T1	TE/TI	RDD+	RDHE+	RDD2+	RDHE2+	RDND+
80.0	5.042%08	0.0014	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.052%09	0.0029	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.083%10	0.0296	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	4.413%10	0.1206	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	8.831%10	0.2414	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.124%11	0.3072	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.159%11	0.3169	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.124%11	0.3073	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.100%11	0.3007	305.1	305.1	305.1	1.0000	1.266	0.0000	0.0000	0.0000	0.0000
125.0	1.133%11	0.3096	351.7	383.4	351.7	1.0903	1.979	0.0000	0.0000	0.0000	0.0000
130.0	1.188%11	0.3247	397.0	460.5	397.0	1.1600	3.076	0.0000	0.0000	0.0000	0.0000
135.0	1.217%11	0.3326	439.6	534.9	439.6	1.2167	4.736	0.0000	0.0000	0.0000	0.0000
140.0	1.248%11	0.3412	477.8	604.8	477.8	1.2659	7.175	0.0000	0.0000	0.0000	0.0000
150.0	1.323%11	0.3616	539.0	729.6	539.0	1.3535	15.113	0.0000	0.0000	0.0000	0.0000
160.0	1.422%11	0.3887	583.1	837.1	583.1	1.4357	26.363	0.0000	0.0000	0.0000	0.0000
170.0	1.585%11	0.4331	615.1	932.7	615.1	1.5163	36.882	0.0000	0.0000	0.0000	0.0000
180.0	1.973%11	0.5392	639.2	1020.3	641.3	1.5910	44.217	0.0000	0.0000	0.0000	0.0000
190.0	2.345%11	0.6409	657.9	1102.5	667.3	1.6522	49.297	0.0000	0.0000	0.0000	0.0000
200.0	2.858%11	0.7811	672.8	1180.9	693.3	1.7033	53.471	0.0000	0.0000	0.0000	0.0000
210.0	3.257%11	0.8902	684.8	1256.5	719.3	1.7467	57.448	0.0000	0.0000	0.0000	0.0000
220.0	3.514%11	0.9604	694.7	1329.9	745.4	1.7842	61.526	0.0000	0.0000	0.0000	0.0000
230.0	3.636%11	0.9938	702.9	1401.5	771.4	1.8169	65.823	0.0000	0.0000	0.0000	0.0000
240.0	3.658%11	0.9997	709.6	1471.8	797.4	1.8458	70.397	0.0000	0.0000	0.0000	0.0000
250.0	3.575%11	0.9773	719.9	1609.1	849.4	1.8943	80.490	0.0000	0.0000	0.0000	0.0000
260.0	3.376%11	0.9229	727.0	1743.2	901.5	1.9338	91.650	0.0000	0.0000	0.0000	0.0000
270.0	3.091%11	0.8449	731.9	1875.3	953.5	1.9667	98.000	0.0000	0.0000	0.0000	0.0000
280.0	2.755%11	0.7531	735.5	2005.8	1005.6	1.9947	98.409	0.0000	0.0000	0.0000	0.0000
290.0	2.403%11	0.6567	738.0	2135.3	1057.7	2.0189	98.416	0.0000	0.0000	0.0000	0.0000
300.0	2.059%11	0.5629	739.8	2219.6	1109.9	1.9999	98.414	0.0000	0.0000	0.0000	0.0000
310.0	1.744%11	0.4767	741.1	2259.5	1162.3	1.9440	98.411	1.211	0.135	0.003	0.239
320.0	1.466%11	0.4006	742.1	2299.5	1215.2	1.8923	98.408	1.341	0.149	0.001	0.101
330.0	1.228%11	0.3355	742.8	2339.2	1269.3	1.8428	98.399	1.402	0.156	0.001	0.043
340.0	2.403%11	0.2812	743.4	2378.8	1325.2	1.7951	98.276	1.535	0.171	0.000	1.344
350.0	2.059%11	0.2364	743.8	2418.6	1382.7	1.7491	97.221	2.494	0.277	0.000	0.567
360.0	1.744%11	0.1999	744.2	2458.3	1441.4	1.7054	95.705	3.863	0.429	0.000	0.239
370.0	1.466%11	0.1704	744.5	2498.0	1500.7	1.6646	94.186	5.232	0.581	0.000	0.003
380.0	1.215%10	0.1704	744.7	2537.8	1560.2	1.6266	92.678	6.589	0.732	0.000	0.003
390.0	1.029%11	0.1274	744.9	2577.6	1619.8	1.5913	91.176	7.941	0.882	0.000	0.018
400.0	8.649%10	0.1119	745.0	2617.3	1679.4	1.5585	89.673	9.295	1.033	0.000	0.008
410.0	7.315%10	0.0993	745.1	2657.1	1739.0	1.5279	88.158	10.658	1.184	0.000	0.008
420.0	6.236%10	0.0890	745.2	2696.8	1798.7	1.4993	86.619	12.043	1.338	0.000	0.000
430.0	5.364%10	0.1466	744.7	2736.6	1858.3	1.4726	85.039	13.465	1.496	0.000	0.000
440.0	4.661%10	0.2812	745.6	2776.3	1917.9	1.4476	83.403	14.937	1.660	0.000	0.000
450.0	4.092%10	0.0737	745.4	2816.1	1977.6	1.4240	81.692	16.477	1.831	0.000	0.000
460.0	3.631%10	0.0680	745.4	2855.8	2037.2	1.4018	79.895	18.095	2.011	0.000	0.000
470.0	3.256%10	0.0633	745.5	2895.6	2096.8	1.3809	78.005	19.795	2.199	0.000	0.000
480.0	2.949%10	0.0594	745.5	2935.4	2156.5	1.3612	76.031	21.572	2.397	0.000	0.000
490.0	2.697%10	0.0561	745.6	2975.1	2216.1	1.3425	73.986	23.412	2.601	0.000	0.000
500.0	2.489%10	0.0533	745.6	3014.9	2275.7	1.3248	71.895	25.295	2.811	0.000	0.000
510.0	2.316%10	0.0509	745.6	3054.6	2335.4	1.3080	69.781	27.197	3.022	0.000	0.000
520.0	2.949%10	0.0473	745.7	3094.4	2395.0	1.2920	67.669	3.233	0.000	0.000	0.000
WE PUT B1= 3.070 GET HST											

INPUT: LAT= 42.6 LONGI= 288.5 R= 10 MONTH= 3 HOUR= 6.2

CALCULATED VALUES: NLAT= 54.0 MLONG= 35.0 XHI= 90.0
 DTP= 71.5 MDTP= 55.5 MAGLA= 56.3 L.T.= -3.3
 SUNRISE: 6:2 L.T. SUNSET: 17:8 SUN DEC= -3.0
 NMF2= 1.13% NMF1= 0.00% -01 NAME= 3.10%10 NMD= 4.00%08
 HMF= 107.5 HMD= 84.5

INPUT: LATI= 42.6 LONGI= 288.5 RI= 10 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9

DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 140.7

SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC. = -3.3

NMF2= 8.57% 10 HMF1= 0.00%-01 NME= 1.78%09 NMD= 4.00%08

HMF2= 315.7 HMF1= 0.0 HME= 105.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDDHE+	RDD-	RDNDE+	RDNH+
80.0	5.392%05	6.3%6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.473%08	0.0029	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.729%08	0.0055	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0203	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0207	-1	-1	-1	0.020	0.000	0.000	17.950	82.030
105.0	1.775%09	0.0207	-1	-1	-1	0.031	0.000	0.000	20.889	79.081
110.0	1.451%09	0.0169	-1	-1	-1	0.048	0.000	0.000	24.232	75.721
115.0	9.453%08	0.0110	-1	-1	-1	0.074	0.000	0.000	27.887	72.039
120.0	6.015%08	0.0070	287.1	287.1	0.015	0.000	0.000	0.000	31.524	68.361
125.0	4.234%08	0.0049	326.8	348.2	1.0654	0.178	0.000	0.000	34.509	65.313
130.0	3.503%08	0.0041	365.3	408.1	365.3	1.1170	0.275	0.000	36.301	63.424
135.0	3.445%08	0.0040	400.9	465.0	400.9	1.1599	0.425	0.000	36.979	62.596
140.0	3.928%08	0.0046	431.8	517.3	431.8	1.1980	0.655	0.000	37.000	62.345
145.0	6.552%08	0.0076	478.9	607.2	478.9	1.2678	1.526	0.000	36.335	62.139
150.0	1.109%09	0.0129	511.0	682.0	511.0	1.3338	3.349	0.000	35.403	61.248
155.0	1.811%09	0.0211	523.4	747.2	523.4	1.3832	6.470	0.000	34.024	59.510
160.0	2.482%09	0.0289	549.9	806.4	549.9	1.4170	10.420	0.000	30.434	59.146
165.0	3.440%09	0.0401	562.5	861.7	562.5	1.4410	14.368	0.000	22.930	62.702
170.0	4.847%09	0.0565	572.4	914.4	572.4	1.4585	18.218	0.000	15.380	66.403
175.0	7.011%09	0.0818	580.3	965.1	580.3	1.4715	22.327	0.000	10.039	67.634
180.0	1.065%10	0.1242	586.8	1014.3	586.8	1.4813	27.036	0.000	6.526	63.438
185.0	1.761%10	0.2055	592.2	1062.4	592.2	1.4887	32.605	0.000	4.240	63.155
190.0	2.732%10	0.3187	596.6	1109.5	596.6	1.4942	39.266	0.000	2.755	57.979
195.0	5.099%10	0.5948	603.3	1201.7	603.3	1.5015	56.879	0.000	1.163	41.958
200.0	7.221%10	0.8423	607.9	1291.8	607.9	1.5054	81.441	0.000	0.491	18.069
205.0	8.363%10	0.9755	611.1	1380.6	611.1	1.5073	98.000	0.000	0.207	1.793
210.0	8.566%10	0.9991	613.4	1468.3	973.6	1.5082	99.107	0.000	0.087	0.806
215.0	8.349%10	0.9739	615.0	1555.5	1031.0	1.5087	99.085	0.000	0.037	0.438
220.0	7.873%10	0.9183	616.2	1642.1	1087.7	1.5097	99.020	0.000	0.016	0.185
225.0	7.211%10	0.8411	617.1	1728.5	1142.7	1.5126	98.914	0.000	0.007	0.078
230.0	6.448%10	0.7521	617.7	1814.6	1193.4	1.5205	98.352	1.451	0.161	0.003
235.0	5.657%10	0.6598	618.2	1814.7	1235.5	1.4688	94.980	4.504	0.500	0.001
240.0	4.897%10	0.5712	618.6	1814.8	1264.5	1.4352	90.538	8.510	0.946	0.006
245.0	4.203%10	0.4903	618.8	1814.9	1280.3	1.4175	86.145	0.701	0.078	0.002
250.0	3.595%10	0.4193	619.1	1815.0	1287.5	1.4096	81.802	0.901	0.100	0.001
255.0	3.075%10	0.3587	619.2	1815.0	1290.5	1.4065	77.467	20.279	0.253	0.000
260.0	2.640%10	0.3079	619.4	1815.1	1291.7	1.4052	73.102	24.208	2.690	0.000
265.0	2.281%10	0.2660	619.5	1815.2	1292.2	1.4047	68.675	28.192	3.132	0.000
270.0	1.987%10	0.2317	619.6	1815.3	1292.5	1.4045	64.178	32.239	3.582	0.000
275.0	1.747%10	0.2037	619.7	1815.4	1292.7	1.4044	59.629	36.333	4.037	0.000
280.0	1.551%10	0.1809	619.7	1815.4	1292.8	1.4043	55.077	40.431	4.492	0.000
285.0	1.392%10	0.1623	619.8	1815.5	1292.9	1.4042	50.589	44.470	4.941	0.000
290.0	1.262%10	0.1471	619.8	1815.6	1293.0	1.4041	46.240	48.384	5.376	0.000
295.0	1.155%10	0.1347	619.9	1815.7	1293.2	1.4041	42.097	52.113	5.790	0.000
300.0	1.067%10	0.1245	619.9	1815.8	1293.3	1.4040	38.204	55.616	6.180	0.000
305.0	9.952%09	0.1161	619.9	1815.8	1293.4	1.4039	34.592	58.868	6.541	0.000
310.0	9.354%09	0.1091	620.0	1815.9	1293.5	1.4038	31.268	61.859	6.873	0.000
315.0	8.857%09	0.1033	620.0	1816.0	1293.7	1.4038	28.230	64.593	7.177	0.000
320.0	8.443%09	0.0985	620.0	1816.1	1293.8	1.4037	25.466	67.081	7.453	0.000
325.0	8.096%09	0.0944	620.0	1816.2	1293.9	1.4036	22.959	69.327	7.704	0.000
330.0	7.805%09	0.0910	620.0	1816.2	1294.0	1.4036	20.691	71.378	7.931	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 42.6 LONGI= 288.5 R= 10 MONTH= 6 HOUR=12.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHIZ= 19.5
 SUNRISE: 4.5 L.T. SUNSET: 19.5 L.T. SUN DEC.= 23.1
 NMF2=3.05%11 NMFL1= 2.34%11 NMD=6.16%08
 HMF2=205.5 HMFL1=160.1 HMD= 81.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDD*	RDD2+	RDDN+	RDDH+	RDDH*	RDN+	RDN*
80.0	5.865%08	0.0019	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.239%09	0.0041	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.272%10	0.0417	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	5.142%10	0.1687	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.023%11	0.3358	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.299%11	0.4262	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.340%11	0.4395	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.306%11	0.4283	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.277%11	0.4188	308.3	308.3	1.0000	1.0000	-1	-1	-1	-1	-1	-1	-1	-1
125.0	1.319%11	0.4326	356.1	387.4	1.0878	1.0878	-1	-1	-1	-1	-1	-1	-1	-1
130.0	1.474%11	0.4835	402.7	465.2	1.1554	1.1554	-1	-1	-1	-1	-1	-1	-1	-1
135.0	1.649%11	0.5410	446.6	540.4	1.2102	1.2102	-1	-1	-1	-1	-1	-1	-1	-1
140.0	1.824%11	0.5983	486.1	611.2	1.2574	1.2574	-1	-1	-1	-1	-1	-1	-1	-1
145.0	2.148%11	0.7047	550.0	737.7	1.3413	1.3413	-1	-1	-1	-1	-1	-1	-1	-1
150.0	2.333%11	0.7654	596.5	846.8	1.4196	1.4196	-1	-1	-1	-1	-1	-1	-1	-1
155.0	2.624%11	0.8609	630.6	943.5	1.4961	1.4961	-1	-1	-1	-1	-1	-1	-1	-1
160.0	2.848%11	0.9344	656.4	1031.8	1.5704	1.5704	-1	-1	-1	-1	-1	-1	-1	-1
165.0	2.983%11	0.9788	676.4	1114.4	1.6330	1.6330	-1	-1	-1	-1	-1	-1	-1	-1
170.0	3.041%11	0.9978	692.4	1193.0	1.6854	1.6854	-1	-1	-1	-1	-1	-1	-1	-1
175.0	3.045%11	0.9991	705.4	1268.5	1.7301	1.7301	-1	-1	-1	-1	-1	-1	-1	-1
180.0	3.020%11	0.9907	716.0	1341.7	1.7687	1.7687	-1	-1	-1	-1	-1	-1	-1	-1
185.0	2.969%11	0.9742	724.8	1413.1	1.8024	1.8024	-1	-1	-1	-1	-1	-1	-1	-1
190.0	2.983%11	0.9788	676.4	1114.4	1.8322	1.8322	-1	-1	-1	-1	-1	-1	-1	-1
195.0	2.896%11	0.9502	732.1	1619.1	1.8824	1.8824	-1	-1	-1	-1	-1	-1	-1	-1
200.0	2.693%11	0.8837	743.2	1260.0	1.9232	1.9232	-1	-1	-1	-1	-1	-1	-1	-1
205.0	2.437%11	0.7997	750.9	1752.0	1.9687	1.9687	-1	-1	-1	-1	-1	-1	-1	-1
210.0	2.155%11	0.7071	756.2	1882.5	1.9574	1.9574	-1	-1	-1	-1	-1	-1	-1	-1
215.0	1.870%11	0.6135	760.0	2011.4	1.9865	1.9865	-1	-1	-1	-1	-1	-1	-1	-1
220.0	1.599%11	0.5248	762.7	1063.4	2.0117	2.0117	-1	-1	-1	-1	-1	-1	-1	-1
225.0	1.354%11	0.4444	764.7	2139.2	1.9945	1.9945	-1	-1	-1	-1	-1	-1	-1	-1
230.0	1.140%11	0.3741	766.1	2222.6	1.9409	1.9409	-1	-1	-1	-1	-1	-1	-1	-1
235.0	9.577%10	0.3142	767.2	2262.2	1.9165	1.9165	-1	-1	-1	-1	-1	-1	-1	-1
240.0	8.053%10	0.2642	768.0	2302.0	1.9423	1.9423	-1	-1	-1	-1	-1	-1	-1	-1
245.0	6.796%10	0.2230	770.0	2341.8	1.9760	1.9760	-1	-1	-1	-1	-1	-1	-1	-1
250.0	4.256%10	0.1396	769.8	2381.7	1.9945	1.9945	-1	-1	-1	-1	-1	-1	-1	-1
255.0	3.707%10	0.1216	770.0	2421.6	1.9520	1.9520	-1	-1	-1	-1	-1	-1	-1	-1
260.0	2.260%10	0.1070	770.0	2421.6	1.9477	1.9477	-1	-1	-1	-1	-1	-1	-1	-1
265.0	1.983%10	0.0650	770.3	2621.4	1.9590	1.9590	-1	-1	-1	-1	-1	-1	-1	-1
270.0	1.473%10	0.0950	771.0	2461.5	1.9423	1.9423	-1	-1	-1	-1	-1	-1	-1	-1
275.0	1.843%10	0.0605	770.5	2661.3	1.9741	1.9741	-1	-1	-1	-1	-1	-1	-1	-1
280.0	2.598%10	0.0852	770.8	2501.5	1.9656	1.9656	-1	-1	-1	-1	-1	-1	-1	-1
285.0	1.726%10	0.0566	770.6	2701.3	1.9161	1.9161	-1	-1	-1	-1	-1	-1	-1	-1
290.0	1.627%10	0.0534	770.9	2741.2	1.9497	1.9497	-1	-1	-1	-1	-1	-1	-1	-1
295.0	2.150%10	0.0706	770.7	1861.2	1.9728	1.9728	-1	-1	-1	-1	-1	-1	-1	-1
300.0	1.544%10	0.0507	770.7	2781.2	1.9214	1.9214	-1	-1	-1	-1	-1	-1	-1	-1
305.0	1.983%10	0.0483	771.0	2821.1	1.981.0	1.981.0	-1	-1	-1	-1	-1	-1	-1	-1
310.0	1.413%10	0.0464	771.0	2861.1	1.94018	1.94018	-1	-1	-1	-1	-1	-1	-1	-1
315.0	1.362%10	0.0447	771.0	2901.1	1.9090	1.9090	-1	-1	-1	-1	-1	-1	-1	-1
320.0	1.318%10	0.0433	771.0	2941.0	1.8610	1.8610	-1	-1	-1	-1	-1	-1	-1	-1
325.0	3.071%08	0.0304	3100.8	2160.9	1.812	1.812	-1	-1	-1	-1	-1	-1	-1	-1
330.0	3.071%08	0.0304	3100.8	2200.8	1.8423	1.8423	-1	-1	-1	-1	-1	-1	-1	-1
335.0	3.071%08	0.0304	3100.8	2280.7	1.8835	1.8835	-1	-1	-1	-1	-1	-1	-1	-1
340.0	3.071%08	0.0304	3100.8	3020.9	1.9092	1.9092	-1	-1	-1	-1	-1	-1	-1	-1
345.0	3.071%08	0.0304	3100.8	2182.1	1.9429	1.9429	-1	-1	-1	-1	-1	-1	-1	-1
350.0	3.071%08	0.0304	3100.8	2041.0	1.9421	1.9421	-1	-1	-1	-1	-1	-1	-1	-1
355.0	3.071%08	0.0304	3100.8	1981.0	1.9418	1.9418	-1	-1	-1	-1	-1	-1	-1	-1
360.0	3.071%08	0.0304	3100.8	1921.1	1.9477	1.9477	-1	-1	-1	-1	-1	-1	-1	-1
365.0	3.071%08	0.0304	3100.8	1861.2	1.9590	1.9590	-1	-1	-1	-1	-1	-1	-1	-1
370.0	3.071%08	0.0304	3100.8	1801.3	1.9583	1.9583	-1	-1	-1	-1	-1	-1	-1	-1
375.0	3.071%08	0.0304	3100.8	1741.4	1.9583	1.9583	-1	-1	-1	-1	-1	-1	-1	-1
380.0	3.071%08	0.0304	3100.8	1681.4	1.9590	1.9590	-1	-1	-1	-1	-1	-1	-1	-1
385.0	3.071%08	0.0304	3100.8	1621.5	1.9590	1.9590	-1	-1	-1	-1	-1	-1	-1	-1
390.0	3.071%08	0.0304	3100.8	1561.6	1.9656	1.9656	-1	-1	-1	-1	-1	-1	-1	-1
395.0	3.071%08	0.0304	3100.8	1501.7	1.9656	1.9656	-1	-1	-1	-1	-1	-1	-1	-1
400.0	3.071%08	0.0304	3100.8	1442.3	1.9749	1.9749	-1	-1	-1	-1	-1	-1	-1	-1
405.0	3.071%08	0.0304	3100.8	1383.5	1.9749	1.9749	-1	-1	-1	-1	-1	-1	-1	-1
410.0	3.071%08	0.0304	3100.8	1326.1	1.9760	1.9760	-1	-1	-1	-1	-1	-1	-1	-1
415.0	3.071%08	0.0304	3100.8	1267.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
420.0	3.071%08	0.0304	3100.8	1209.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
425.0	3.071%08	0.0304	3100.8	1150.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
430.0	3.071%08	0.0304	3100.8	1092.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
435.0	3.071%08	0.0304	3100.8	1033.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
440.0	3.071%08	0.0304	3100.8	975.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
445.0	3.071%08	0.0304	3100.8	917.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
450.0	3.071%08	0.0304	3100.8	860.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
455.0	3.071%08	0.0304	3100.8	801.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
460.0	3.071%08	0.0304	3100.8	743.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
465.0	3.071%08	0.0304	3100.8	684.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
470.0	3.071%08	0.0304	3100.8	626.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
475.0	3.071%08	0.0304	3100.8	567.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
480.0	3.071%08	0.0304	3100.8	509.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
485.0	3.071%08	0.0304	3100.8	450.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
490.0	3.071%08	0.0304	3100.8	392.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
495.0	3.071%08	0.0304	3100.8	333.6	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
500.0	3.071%08	0.0304	3100.8	275.1	1.9864	1.9864	-1	-1	-1	-1	-1	-1	-1	-1
505.0	3.071%08	0.0304	3100.8	216.6	1.9864	1.9864	-1							

INPUT: LATI= 42.6 LONGI= 288.5 R= 10 MONTH= 6 HOUR= 4.5

CALCULATED VALUES: MLAT= 54.0 MLONG= 357.9
 DIP= 71.5 MCDDIP= 55.5 MAGLA= 56.3 XHI= 90.0
 SUNRISE: 4.5 L.T. SUNSET: 19.5 L.T. SUN DEC.= 23.1
 NMF1= 9.79%10 NMFI1= 0.000%01 TIME=2.98%10 NMHD=4.00%08
 NMF2=235.9 NMFI2= 0.0 HME=107.5 HMD= 84.5

H	NE	N/HMAX	TN	TE	TI	TE/TI	RDO+	RDH+	RDO2+	RDH+	RDO3+	RDH+
80.0	2.814%08	0.0029	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.102%08	0.0042	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.809%09	0.0185	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.132%10	0.1157	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.458%10	0.2512	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	2.962%10	0.3027	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.887%10	0.2950	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	2.406%10	0.2459	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.937%10	0.1979	292.9	292.9	1.0000	0.016	0.000	0.000	0.000	0.000	0.000	0.000
125.0	1.714%10	0.1752	334.9	362.1	334.9	1.0812	0.031	0.000	0.000	0.000	0.000	0.000
130.0	1.769%10	0.1808	375.6	430.0	375.6	1.1447	0.059	0.000	0.000	0.000	0.000	0.000
135.0	2.015%10	0.2059	413.4	495.0	413.4	1.1972	0.111	0.004	0.000	0.000	0.000	0.000
140.0	2.340%10	0.2391	446.6	555.4	446.6	1.2434	0.210	0.000	0.000	0.000	0.000	0.000
150.0	3.102%10	0.3170	498.2	661.3	498.2	1.3274	0.704	0.000	0.000	0.000	0.000	0.000
160.0	3.819%10	0.3903	533.8	751.3	533.8	1.4073	2.040	0.000	0.000	0.000	0.000	0.000
170.0	4.916%10	0.5023	559.1	830.9	562.0	1.4784	4.568	0.000	0.000	0.000	0.000	0.000
180.0	6.222%10	0.6358	577.8	903.9	590.1	1.5319	7.728	0.000	0.000	0.000	0.000	0.000
190.0	7.423%10	0.7596	592.1	972.6	618.2	1.5734	10.889	0.000	0.000	0.000	0.000	0.000
200.0	8.414%10	0.8598	603.4	1038.3	646.2	1.6067	14.130	0.000	0.000	0.000	0.000	0.000
210.0	9.123%10	0.9332	612.5	1101.8	674.3	1.6340	17.781	0.000	0.000	0.000	0.000	0.000
220.0	9.569%10	0.9779	620.0	1163.6	702.4	1.6567	22.141	0.000	0.000	0.000	0.000	0.000
230.0	9.761%10	0.9974	626.1	1224.1	730.4	1.6758	27.474	0.000	0.000	0.000	0.000	0.000
240.0	9.779%10	0.9993	631.1	1283.5	758.5	1.6922	34.052	0.000	0.000	0.000	0.000	0.000
250.0	9.557%10	0.9766	638.8	1399.9	814.6	1.7185	52.250	0.000	0.000	0.000	0.000	0.000
260.0	9.060%10	0.9258	644.1	1513.9	870.7	1.7387	79.114	0.000	0.000	0.000	0.000	0.000
300.0	8.358%10	0.8541	647.9	1626.4	926.8	1.7547	98.000	0.000	0.000	0.000	0.000	0.000
320.0	7.532%10	0.7697	650.5	1737.7	982.9	1.7679	99.313	0.000	0.000	0.000	0.000	0.000
340.0	6.658%10	0.6804	652.4	1848.3	1038.9	1.7792	99.338	0.000	0.000	0.000	0.000	0.000
360.0	5.799%10	0.5926	653.7	1934.4	1094.5	1.7673	99.337	0.329	0.037	0.025	0.027	0.000
380.0	4.997%10	0.5107	654.7	1996.2	1149.4	1.7368	99.334	0.486	0.054	0.010	0.115	0.000
400.0	4.279%10	0.4372	655.4	2058.1	1202.3	1.7118	99.330	0.555	0.062	0.004	0.049	0.000
420.0	3.653%10	0.3733	656.0	2078.0	1251.3	1.6607	99.322	0.590	0.066	0.002	0.021	0.000
440.0	3.120%10	0.3188	656.4	2098.4	1294.4	1.6209	99.197	0.714	0.079	0.001	0.009	0.000
460.0	2.673%10	0.2731	656.8	2118.0	1331.5	1.5907	98.133	1.677	0.186	0.000	0.004	0.000
480.0	2.302%10	0.2253	657.0	2137.9	1364.7	1.5666	96.602	3.056	0.340	0.000	0.002	0.000
500.0	1.997%10	0.2040	657.2	2157.9	1396.0	1.5458	95.069	4.437	0.493	0.000	0.001	0.000
520.0	1.746%10	0.1784	657.4	2177.9	1426.5	1.5268	93.547	5.807	0.645	0.000	0.000	0.000
540.0	1.540%10	0.1574	657.5	2197.9	1456.6	1.5089	92.031	7.172	0.797	0.000	0.000	0.000
560.0	1.371%10	0.1401	657.6	2217.9	1486.7	1.4918	90.514	8.538	0.949	0.000	0.000	0.000
580.0	1.232%10	0.1259	657.7	2237.9	1516.7	1.4755	88.985	9.914	1.102	0.000	0.000	0.000
600.0	1.118%10	0.1142	657.8	2257.9	1546.7	1.4598	87.431	11.312	1.257	0.000	0.000	0.000
620.0	1.023%10	0.1045	657.8	2277.9	1576.7	1.4447	85.837	12.747	1.416	0.000	0.000	0.000
640.0	9.440%09	0.0965	657.9	2297.9	1606.7	1.4302	84.185	14.233	1.581	0.000	0.000	0.000
660.0	8.783%09	0.0897	657.9	2317.9	1636.7	1.4162	82.458	15.788	1.754	0.000	0.000	0.000
680.0	8.233%09	0.0841	658.0	2337.9	1666.7	1.4027	80.644	17.421	1.936	0.000	0.000	0.000
700.0	7.771%09	0.0794	658.0	2357.9	1696.7	1.3897	78.737	19.137	2.126	0.000	0.000	0.000
720.0	7.381%09	0.0754	658.0	2377.9	1726.7	1.3771	76.744	20.931	2.326	0.000	0.000	0.000
740.0	7.051%09	0.0720	658.1	2397.9	1756.7	1.3650	74.680	22.788	2.532	0.000	0.000	0.000
760.0	6.771%09	0.0692	658.1	2417.9	1786.7	1.3533	72.569	24.688	2.743	0.000	0.000	0.000
780.0	6.532%09	0.0667	658.1	2437.9	1816.7	1.3419	70.436	26.608	2.956	0.000	0.000	0.000
800.0	6.328%09	0.0647	658.1	2457.9	1846.7	1.3310	68.303	28.527	3.170	0.000	0.000	0.000

WE PUT BL= 3.0TU GET HST

INPUT: LATI = 42.6 LONGI = 238.5 R = 18 MUNIH = 6 AJUR = 0.0

CALCULATED VALUES: MLAT = 54.0 MLNG = 357.9 XHI = 114.3
 DIP = 71.5 MODIP = 55.5 MAGLA = 56.3 L.T. = 19.5 SUN DEC. = 23.1
 SUNRTE = 4.5 L.T. SUHIT = 0.00%01 NME = 1.78%09 NMD = 4.00%08
 NMF1 = 1.17%11 NMF2 = 1.29%14 HMF1 = 0.0 HME = 105.1 HMD = 87.9

INPUT: LAT= 42.6 LONGI= 288.5 R= 10 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 65.5
 SUNRISE: 7:5 L.T. SUNSET:16.5 L.T.
 NMF1=5.19%11 NMFL= 0.00%10 NMED=9.07%10 NMHD=4.00%08
 HMFL=213.7 HMF1= 0.0 HME=109.9 HMD= 81.2

H	NE	TN	TE	TI	TE/TI	RDH+	RDD+	RDHE+	RDH-	RDD-	RDHE-
80.0	3.777%08	7.3%4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	7.558%08	0.0015	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	7.868%09	0.0152	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	3.316%10	0.0639	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	6.806%10	0.1312	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	8.773%10	0.1691	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	9.067%10	0.1748	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	8.548%10	0.1647	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	8.080%10	0.1557	301.7	301.7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125.0	8.620%10	0.1661	347.0	379.1	347.0	1.0925	2.005	0.000	0.000	0.000	46.514
130.0	9.700%10	0.1870	391.0	455.2	391.0	1.1642	2.999	0.000	0.000	0.000	47.751
135.0	1.044%11	0.2013	432.3	528.5	432.3	1.2227	4.475	0.000	0.000	0.000	46.727
140.0	1.129%11	0.2176	469.0	597.4	469.0	1.2737	6.652	0.000	0.000	0.000	48.797
150.0	1.347%11	0.2596	527.4	720.0	527.4	1.3650	14.332	0.000	0.000	0.000	48.348
160.0	1.745%11	0.3306	569.0	825.7	569.0	1.4512	28.637	0.000	0.000	0.000	39.856
170.0	2.658%11	0.5124	599.0	919.9	599.0	1.5356	48.995	0.000	0.000	0.000	33.772
180.0	3.669%11	0.7071	621.5	1006.5	621.5	1.6086	67.894	0.000	0.000	0.000	24.839
190.0	4.485%11	0.8644	638.8	1088.1	638.8	1.6679	79.315	0.000	0.000	0.000	13.925
200.0	4.985%11	0.9609	652.6	1166.1	679.0	1.7173	84.800	0.000	0.000	0.000	6.738
210.0	5.177%11	0.9977	663.8	1241.4	705.6	1.7592	87.531	0.000	0.000	0.000	3.163
220.0	5.179%11	0.9981	672.9	1314.7	732.3	1.7953	89.237	0.000	0.000	0.000	10.990
230.0	5.125%11	0.9887	680.4	1386.4	758.9	1.8268	90.597	0.000	0.000	0.000	0.691
240.0	5.026%11	0.9687	686.6	1456.8	785.6	1.8544	91.851	0.000	0.000	0.000	0.323
260.0	4.714%11	0.9086	696.1	1594.6	838.8	1.9009	94.308	0.000	0.000	0.000	0.151
280.0	4.269%11	0.8226	702.6	1729.5	892.1	1.9386	96.728	0.000	0.000	0.000	0.033
300.0	3.800%11	0.7324	707.2	1862.5	945.4	1.9700	98.000	0.000	0.000	0.000	5.659
320.0	3.294%11	0.6349	710.4	1994.1	998.7	1.9966	98.079	0.000	0.000	0.000	3.264
340.0	2.808%11	0.5412	712.8	2124.7	1052.0	2.0196	98.079	0.000	0.000	0.000	1.998
360.0	2.365%11	0.4557	714.4	2210.0	1105.4	1.9993	98.078	0.000	0.000	0.000	0.932
380.0	1.976%11	0.3808	715.6	2250.7	1159.0	1.9420	98.075	0.000	0.000	0.000	0.203
400.0	1.645%11	0.3171	716.6	2291.5	1212.9	1.8893	98.071	0.000	0.000	0.000	0.044
420.0	1.370%11	0.2640	717.2	2330.5	1267.6	1.8384	98.063	0.000	0.000	0.000	0.010
440.0	1.144%11	0.2206	717.8	2369.5	1323.6	1.7902	97.940	0.000	0.000	0.000	0.002
460.0	9.614%10	0.1853	718.2	2408.5	1380.8	1.7443	96.889	2.000	0.000	0.000	0.000
480.0	8.138%10	0.1568	718.5	2447.6	1438.8	1.7012	95.378	4.160	0.000	0.000	0.000
500.0	6.950%10	0.1340	718.8	2486.7	1497.2	1.6609	93.864	5.522	0.614	0.000	0.000
520.0	5.995%10	0.1155	719.0	2525.8	1555.7	1.6236	92.361	6.875	0.764	0.000	0.000
540.0	5.225%10	0.1007	719.1	2564.9	1614.3	1.5888	90.864	8.206	0.914	0.000	0.000
560.0	4.602%10	0.0887	719.3	2604.0	1673.0	1.5565	89.366	9.570	1.063	0.000	0.000
580.0	4.097%10	0.0790	719.4	2643.1	1731.6	1.5264	87.857	10.929	1.214	0.000	0.000
600.0	3.685%10	0.0710	719.5	2682.2	1790.2	1.4982	86.323	12.310	1.368	0.000	0.000
620.0	3.347%10	0.0645	719.5	2721.3	1848.9	1.4718	84.749	13.726	1.525	0.000	0.000
640.0	3.068%10	0.0591	719.6	2760.4	1907.5	1.4471	83.118	15.194	1.688	0.000	0.000
660.0	2.837%10	0.0547	719.6	2799.5	1966.2	1.4238	81.413	16.728	1.859	0.000	0.000
680.0	2.645%10	0.0510	719.7	2838.6	2024.8	1.4019	79.622	18.341	2.038	0.000	0.000
700.0	2.484%10	0.0479	719.7	2877.7	2083.5	1.3812	77.739	20.035	2.226	0.000	0.000
720.0	2.349%10	0.0453	719.8	2916.8	2142.1	1.3616	75.771	21.806	2.423	0.000	0.000
740.0	2.235%10	0.0431	719.8	2955.9	2200.8	1.3431	73.733	23.640	2.627	0.000	0.000
760.0	2.139%10	0.0412	719.8	2995.0	2259.4	1.3255	71.649	25.516	2.835	0.000	0.000
780.0	2.056%10	0.0396	719.8	3034.1	2318.1	1.3089	69.543	27.411	3.046	0.000	0.000
800.0	1.986%10	0.0383	719.9	3073.2	2376.7	1.2930	67.438	29.306	3.256	0.000	0.000
WE PUT B1=	3.0TU GET HST										

INPUT: LATI= 42.6 LONGI= 288.5 R= 10 MONTH=12 HOUR= 7.5

CALCULATED VALUES: MLAT= 54.0 MLONG= 357.9
 DIP= 71.5 MODIP= 55.5 HAGLA= 56.3 XHI= 90.0
 SUNRISE: 7.5 L.T. SUNSET:16.5 L.T. SUN DEC.= -22.9
 NMF1= 1.79%11 NMF1= 0.00%10 NMF1= 3.30%10 NMF1= 4.00%08
 NMF2= 231.6 NMF1= 0.0 HME= 107.5 HMD= 84.5

			TE/TI	RDO+	RDH+	RDO2+	RDH+	RDHE+	RDH0+	RDN0+
H	NE	N/IMAX	TN	TE	-1	-1	-1	-1	-1	-1
80.0	2.813%08	0.0016	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.102%08	0.0023	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.811%09	0.0101	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.173%10	0.0654	-1	-1	-1	-1	-1	0.003	0.000	17.568
100.0	2.660%10	0.1483	-1	-1	-1	-1	-1	0.006	0.000	82.429
105.0	3.279%10	0.1828	-1	-1	-1	-1	-1	0.012	0.000	79.595
110.0	3.195%10	0.1780	-1	-1	-1	-1	-1	0.023	0.000	76.313
115.0	2.632%10	0.1467	-1	-1	-1	-1	-1	0.000	0.000	72.535
120.0	2.084%10	0.1161	290.0	290.0	1.0000	0.044	0.000	0.000	0.000	68.258
125.0	1.824%10	0.1017	330.9	358.4	1.0831	0.084	0.000	0.000	0.000	63.621
130.0	1.867%10	0.1052	370.5	425.5	1.1485	0.161	0.000	0.000	0.000	59.123
135.0	2.172%10	0.1211	407.2	489.7	1.2027	0.307	0.000	0.000	0.000	55.754
140.0	2.549%10	0.1421	439.3	549.3	1.2505	0.584	0.000	0.000	0.000	54.416
150.0	3.519%10	0.1961	653.7	488.6	1.3378	2.074	0.000	0.000	0.000	56.046
160.0	4.422%10	0.2465	522.4	742.5	1.4212	6.909	0.000	0.000	0.000	56.461
170.0	5.856%10	0.3264	546.3	821.4	1.4908	19.661	0.000	0.000	0.000	49.676
180.0	8.681%10	0.4838	563.8	893.9	1.5428	41.885	0.000	0.000	0.000	45.000
190.0	1.179%11	0.6572	577.2	962.4	1.6079	63.787	0.000	0.000	0.000	41.880
200.0	1.452%11	0.8093	587.8	1028.0	1.6153	76.967	0.000	0.000	0.000	4.137
210.0	1.649%11	0.9192	596.4	1091.5	1.6416	83.288	0.000	0.000	0.000	1.545
220.0	1.759%11	0.9802	603.3	1153.5	1.6635	86.496	0.000	0.000	0.000	12.931
230.0	1.794%11	0.9997	609.0	1214.2	1.721.9	1.6820	0.000	0.000	0.000	36.474
240.0	1.789%11	0.9969	613.8	1274.0	1.6978	90.243	0.000	0.000	0.000	2.122
260.0	1.734%11	0.9664	620.9	1391.2	1.7231	93.359	0.000	0.000	0.000	25.653
280.0	1.629%11	0.9080	625.9	1506.2	1.7426	96.398	0.000	0.000	0.000	1.630
300.0	1.489%11	0.8298	629.4	1619.7	1.7580	98.000	0.000	0.000	0.000	0.001
320.0	1.329%11	0.7407	631.8	1732.2	1.7707	98.100	0.000	0.000	0.000	0.001
340.0	1.164%11	0.6485	633.6	1844.0	1.7816	98.101	1.044	0.116	0.000	0.739
360.0	1.004%11	0.5596	634.8	1931.3	1.7694	98.099	0.000	0.000	0.000	0.101
380.0	8.574%10	0.4779	635.7	1994.7	1.1147.2	1.7388	0.000	0.000	0.000	0.014
400.0	7.278%10	0.4056	636.4	2058.0	1.1200.8	1.7138	0.000	0.000	0.000	0.002
420.0	6.163%10	0.3435	637.0	2077.9	1.1250.5	1.6617	0.000	0.000	0.000	0.000
440.0	5.225%10	0.2912	637.4	2097.9	1.1294.9	1.6213	0.000	0.000	0.000	0.000
460.0	4.445%10	0.2478	637.7	2117.9	1.1331.3	1.5908	0.000	0.000	0.000	0.000
480.0	3.805%10	0.2120	637.9	2137.9	1.1364.6	1.5666	0.000	0.000	0.000	0.000
500.0	3.281%10	0.1828	638.1	2157.8	1.1395.9	1.5458	0.000	0.000	0.000	0.000
520.0	2.853%10	0.1590	638.2	2177.8	1.1426.4	1.5268	0.000	0.000	0.000	0.000
540.0	2.505%10	0.1396	638.4	2197.8	1.1456.6	1.5089	0.000	0.000	0.000	0.000
560.0	2.221%10	0.1238	638.5	2217.8	1.1486.7	1.4918	0.000	0.000	0.000	0.000
580.0	1.988%10	0.1108	638.6	2237.8	1.1516.7	1.4755	0.000	0.000	0.000	0.000
600.0	1.797%10	0.1002	638.7	2257.8	1.1546.7	1.4598	0.000	0.000	0.000	0.000
620.0	1.639%10	0.0914	638.7	2277.8	1.1576.7	1.4447	0.000	0.000	0.000	0.000
640.0	1.509%10	0.0841	638.8	2297.8	1.1606.7	1.4302	0.000	0.000	0.000	0.000
660.0	1.401%10	0.0781	638.8	2317.8	1.1636.7	1.4162	0.000	0.000	0.000	0.000
680.0	1.310%10	0.0730	638.8	2337.8	1.1666.7	1.4027	0.000	0.000	0.000	0.000
700.0	1.234%10	0.0688	638.8	2357.8	1.1696.7	1.3897	0.000	0.000	0.000	0.000
720.0	1.170%10	0.0652	638.9	2377.8	1.1726.6	1.3771	0.000	0.000	0.000	0.000
740.0	1.116%10	0.0622	638.9	2397.8	1.1756.6	1.3650	0.000	0.000	0.000	0.000
760.0	1.070%10	0.0596	638.9	2417.8	1.1786.6	1.3533	0.000	0.000	0.000	0.000
780.0	1.031%10	0.0575	638.9	2437.8	1.1816.6	1.3419	0.000	0.000	0.000	0.000
800.0	9.980%09	0.0556	638.9	2457.8	1.1846.6	1.3310	0.000	0.000	0.000	0.000

WE PUT b1= 3.0TU GET hist

TINPUT: LATI= 42.6 LONGI= 288.5 R= 10 MONTH=12 HNUR= 0.0

CALCULATED VALUES: HLAT= 54.0 MLONG= 357.9
 DIP= 71.5 NOODIP= 55.5 MAGLA= 56.3 XHI= 160.3
 SUNRSE: 7.5 L.T. SUNSET:16.5 L.T. SUN DEC. = -22.9
 NMF2=6.34%10 NMFI= 0.00%-01 NME=1.78%09 NMd=4.00%08
 HMF2=312.7 HMFI= 0.0 HME=105.0 HMD= 88.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDH+	RDD2+	RDH2+	RDN+
80.0	4.972%05	7.8%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.456%08	0.0039	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.721%08	0.0074	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.742%09	0.0275	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0280	-1	-1	-1	-1	0.003	0.000	0.000	0.000	17.568
105.0	1.775%09	0.0280	-1	-1	-1	-1	0.006	0.000	0.000	0.000	20.399
110.0	1.449%09	0.0228	-1	-1	-1	-1	0.012	0.000	0.000	0.000	23.675
115.0	9.434%08	0.0149	-1	-1	-1	-1	0.023	0.000	0.000	0.000	27.442
120.0	5.995%08	0.0094	285.1	285.1	1.0000	0.044	0.000	0.000	0.000	0.000	31.769
125.0	4.215%08	0.0066	324.1	345.7	324.1	1.0666	0.084	0.000	0.000	0.000	36.294
130.0	3.484%08	0.0055	361.9	405.1	361.9	1.1192	0.161	0.000	0.000	0.000	40.716
135.0	3.424%08	0.0054	396.7	461.4	396.7	1.1632	0.307	0.000	0.000	0.000	43.939
140.0	3.903%08	0.0062	426.8	513.1	426.8	1.2022	0.584	0.000	0.000	0.000	45.000
150.0	6.516%08	0.0103	472.6	602.0	472.6	1.2739	2.075	0.000	0.000	0.000	41.880
160.0	1.105%09	0.0174	503.5	676.1	504.2	1.3410	6.912	0.000	0.000	0.000	36.631
170.0	1.834%09	0.0289	525.1	740.8	533.4	1.3890	19.672	0.000	0.000	0.000	30.703
180.0	2.325%09	0.0366	540.8	799.8	562.5	1.4217	41.907	0.000	0.000	0.000	21.641
190.0	2.976%09	0.0469	552.9	855.0	591.7	1.4449	63.821	0.000	0.000	0.000	10.559
200.0	3.864%09	0.0609	562.3	907.6	620.9	1.4618	77.006	0.000	0.000	0.000	4.137
210.0	5.121%09	0.0807	569.9	958.3	650.2	1.4743	83.329	0.000	0.000	0.000	1.545
220.0	7.036%09	0.1109	576.1	1007.7	679.2	1.4836	86.537	0.000	0.000	0.000	0.573
230.0	1.051%10	0.1656	581.2	1055.9	708.4	1.4906	88.599	0.000	0.000	0.000	0.212
240.0	1.753%10	0.2762	585.4	1103.3	737.6	1.4959	90.280	0.000	0.000	0.000	0.079
260.0	3.620%10	0.5706	591.8	1196.0	795.9	1.5027	93.390	0.000	0.000	0.000	6.599
280.0	5.349%10	0.8430	596.2	1286.7	854.2	1.5063	96.417	0.000	0.000	0.000	3.582
300.0	6.227%10	0.9815	599.3	1376.1	912.5	1.5081	98.000	0.000	0.000	0.000	2.000
320.0	6.330%10	0.9976	601.5	1464.6	970.7	1.5088	98.071	0.000	0.000	0.000	1.231
340.0	6.142%10	0.9681	603.0	1552.4	1028.6	1.5092	98.071	0.000	0.000	0.000	0.169
360.0	5.774%10	0.9101	604.2	1639.9	1085.9	1.5102	97.965	0.000	0.000	0.000	0.023
380.0	5.280%10	0.8322	605.0	1727.0	1141.3	1.5131	97.860	0.000	0.000	0.000	0.003
400.0	4.719%10	0.7437	605.6	1813.9	1192.5	1.5210	97.304	0.000	0.000	0.000	0.000
420.0	4.143%10	0.6530	606.1	1813.9	1235.0	1.4688	93.968	5.429	0.603	0.000	0.000
440.0	3.593%10	0.5662	606.4	1814.0	1264.2	1.4349	89.573	9.384	1.043	0.000	0.000
460.0	3.091%10	0.4872	606.7	1814.0	1280.1	1.4171	85.227	13.296	1.477	0.000	0.000
480.0	2.652%10	0.4179	606.9	1814.0	1287.1	1.4042	80.930	17.163	0.214	0.000	0.000
500.0	2.276%10	0.3588	607.1	1814.0	1290.2	1.4060	76.642	21.022	2.426	0.270	0.000
520.0	1.961%10	0.3091	607.2	1814.0	1291.3	1.4048	72.323	2.336	0.000	0.000	0.000
540.0	1.701%10	0.2681	607.3	1814.1	1291.7	1.4044	67.944	24.909	2.768	0.000	0.000
560.0	1.487%10	0.2343	607.4	1814.1	1291.9	1.4042	61.404	45.050	4.955	0.000	0.000
580.0	1.311%10	0.2067	607.5	1814.1	1292.0	1.4041	58.994	40.490	4.551	0.000	0.000
600.0	1.168%10	0.1841	607.5	1814.1	1292.1	1.4041	54.404	34.223	6.578	0.000	0.000
620.0	1.051%10	0.1657	607.6	1814.1	1292.1	1.4040	50.050	44.050	4.995	0.000	0.000
640.0	9.556%09	0.1506	607.6	1814.1	1292.1	1.4040	45.748	30.934	6.159	0.000	0.000
660.0	8.772%09	0.1067	607.8	1814.3	1292.3	1.4039	48.827	45.050	5.425	0.000	0.000
680.0	8.122%09	0.1019	607.7	1814.3	1292.3	1.4040	41.648	52.517	5.835	0.000	0.000
700.0	7.587%09	0.1196	607.7	1814.2	1292.2	1.4040	37.797	55.982	6.220	0.000	0.000
720.0	7.142%09	0.1126	607.8	1814.3	1292.3	1.4039	30.934	62.159	6.907	0.000	0.000
740.0	6.772%09	0.1067	607.8	1814.3	1292.3	1.4039	27.929	64.864	7.207	0.000	0.000
760.0	6.453%09	0.1019	607.8	1814.3	1292.3	1.4039	25.194	67.325	7.481	0.000	0.000
780.0	6.204%09	0.0978	607.8	1814.3	1292.4	1.4039	22.714	69.557	7.729	0.000	0.000
800.0	5.986%09	0.0943	607.8	1814.3	1292.4	1.4039	20.471	71.576	7.953	0.000	0.000
WE PUT \$1= 3.0 TO GET HST											

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MNTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 45.9
 SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC.= -3.3
 NMF2=1.02%12 NMFL1= 2.92% 11 NME=1.50%11 NMD=1.14%09
 NMF2=281.5 NMFL1=184.0 HME=110.0 HMD= 81.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDHE+	RDH+	RDN+
80.0	1.080%09	0.0011	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.253%09	0.0022	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.161%10	0.0212	-1	-1	-1	-1	-1	-1	-1	-1
95.0	7.424%10	0.0729	-1	-1	-1	-1	0.322	0.000	0.000	55.186
100.0	1.266%11	0.1244	-1	-1	-1	-1	0.488	0.000	0.000	53.852
105.0	1.475%11	0.1449	-1	-1	-1	-1	0.739	0.000	0.000	52.482
110.0	1.497%11	0.1470	-1	-1	-1	1.118	0.000	0.000	50.977	47.905
115.0	1.452%11	0.1426	-1	-1	-1	1.118	0.000	0.000	49.147	49.163
120.0	1.421%11	0.1395	336.2	336.2	1.690	0.000	0.000	0.000	0.000	46.491
125.0	1.462%11	0.1437	394.6	420.2	2.552	0.000	0.000	0.000	0.000	45.659
130.0	1.518%11	0.1492	451.7	502.8	3.844	0.000	0.000	0.000	0.000	46.779
135.0	0.1.553%11	0.1525	506.8	583.4	5.771	0.000	0.000	0.000	0.000	53.846
140.0	1.595%11	0.1567	558.4	660.5	8.609	0.000	0.000	0.000	0.000	54.391
145.0	1.714%11	0.1684	648.0	801.2	12.648	0.000	0.000	0.000	0.000	50.770
150.0	1.920%11	0.1886	719.6	923.8	2838	0.000	0.000	0.000	0.000	39.126
160.0	2.337%11	0.2296	776.1	1031.3	3289	0.000	0.000	0.000	0.000	23.357
170.0	2.871%11	0.2820	821.0	1127.4	3731	72.989	0.000	0.000	0.000	14.714
180.0	3.534%11	0.3471	857.4	1214.8	4168	81.759	0.000	0.000	0.000	7.860
190.0	4.646%11	0.4564	887.2	1295.6	4604	85.877	0.000	0.000	0.000	6.857
200.0	5.809%11	0.5706	911.7	1371.2	5040	88.060	0.000	0.000	0.000	6.860
210.0	6.939%11	0.6816	932.2	1442.7	5477	89.555	0.000	0.000	0.000	6.895
220.0	7.958%11	0.7817	949.2	1510.8	5910	90.823	0.000	0.000	0.000	6.95
230.0	8.805%11	0.8649	963.4	1567.1	6303	92.025	0.000	0.000	0.000	6.240
240.0	9.871%11	0.9696	985.1	1699.9	6983	94.409	0.000	0.000	0.000	4.743
250.0	1.018%12	0.9999	1000.2	1617.1	7554	96.764	0.000	0.000	0.000	2.822
260.0	1.007%12	0.9889	1010.9	1929.9	8046	98.000	0.000	0.000	0.000	1.798
270.0	9.712%11	0.9541	1018.3	2039.5	103.7	8479	0.077	0.000	0.000	1.824
280.0	9.159%11	0.8997	1023.7	2146.9	1138.1	8865	0.077	0.000	0.000	1.320
290.0	8.465%11	0.8316	1027.6	2219.8	1172.7	8929	0.075	0.126	0.024	0.645
300.0	7.693%11	0.7557	1030.4	2032.5	1208.2	8702	0.073	0.160	0.012	0.315
310.0	6.896%11	0.6775	1034.1	2339.2	1245.5	8462	0.069	0.177	0.006	0.154
320.0	6.120%11	0.6012	1034.1	2146.9	1138.1	8865	0.077	0.186	0.003	0.075
330.0	5.393%11	0.5298	1035.4	2378.8	1333.6	7838	0.077	0.199	0.004	0.037
340.0	4.735%11	0.4651	1036.3	2418.6	1386.3	7446	0.075	1.131	0.018	0.018
350.0	4.152%11	0.4079	1037.0	2458.3	1462.8	7038	0.073	1.441	0.012	0.009
360.0	3.645%11	0.3581	1037.6	2498.0	1501.2	6640	0.069	1.594	0.003	0.009
370.0	3.211%11	0.3154	1038.1	2537.8	1560.2	6264	0.069	1.675	0.003	0.004
380.0	2.841%11	0.2791	1038.5	2577.6	1619.8	5913	0.062	1.822	0.001	0.001
390.0	2.529%11	0.2484	1038.8	2617.3	1679.4	5585	0.064	1.914	0.000	0.000
400.0	2.265%11	0.2225	1039.0	2657.1	1739.0	5279	0.064	1.957	0.000	0.000
410.0	2.044%11	0.2008	1039.3	2696.8	1798.6	4994	0.064	2.038	0.000	0.000
420.0	1.858%11	0.1825	1039.4	2736.6	1858.3	4727	0.064	2.111	0.000	0.000
430.0	1.701%11	0.1671	1039.6	2776.3	1917.9	4476	0.062	2.196	0.000	0.000
440.0	1.569%11	0.1541	1039.7	2816.1	1977.5	4240	0.061	2.242	0.000	0.000
450.0	1.457%11	0.1432	1039.8	2855.8	2037.2	4019	0.060	2.342	0.000	0.000
460.0	1.363%11	0.1339	1039.9	2895.6	2096.8	3810	0.059	2.426	0.000	0.000
470.0	1.282%11	0.1260	1040.0	2935.4	2156.4	3612	0.058	2.423	0.000	0.000
480.0	1.214%11	0.1193	1040.0	2975.1	2216.1	3425	0.057	2.442	0.000	0.000
490.0	1.156%11	0.1135	1040.1	3014.9	2275.7	3248	0.056	2.435	0.000	0.000
500.0	1.106%11	0.1086	1040.2	3054.6	2335.3	3080	0.055	2.413	0.000	0.000
510.0	1.063%11	0.1044	1040.2	3094.4	2395.0	3020	0.054	2.356	0.000	0.000
WE PUT B1= 3.0TU GET HST										

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH= 3 HOUR= 6.2

CALCULATED VALUES:
 MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XH1= 90.0
 SUNRISE: 6.2 L.T. SUNSET:17.8 L.T. SUN DEC.: -3.3
 NMF1=2.75% HMF1= 0.00% NM1=4.00% NMD=4.00%
 HMF2=266.5 HNF1= 0.0 HME=107.5 HND= 84.5

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDH+	RDN+
80.0	2.814%	0.0010	-1	-1	-1	-1	-1	-1	-1
85.0	4.102%	0.0015	-1	-1	-1	-1	-1	-1	-1
90.0	1.815%	0.0066	-1	-1	-1	-1	-1	-1	-1
95.0	1.247%	0.0453	-1	-1	-1	-1	-1	-1	-1
100.0	3.068%	0.1115	-1	-1	-1	-1	-1	-1	-1
105.0	3.954%	0.10	0.1437	-1	-1	-1	-1	-1	-1
110.0	3.871%	0.10	0.1407	-1	-1	-1	-1	-1	-1
115.0	3.224%	0.10	0.1172	-1	-1	-1	-1	-1	-1
120.0	2.595%	0.10	0.0943	321.8	321.8	1.00000	0.079	0.000	0.000
125.0	2.299%	0.10	0.0836	374.8	374.8	1.0605	0.127	0.000	0.000
130.0	2.371%	0.10	0.0862	426.4	471.7	1.1063	0.205	0.000	0.000
135.0	2.692%	0.10	0.0978	475.7	543.7	1.1429	0.330	0.000	0.000
140.0	3.115%	0.10	0.1132	611.0	611.0	1.1740	0.530	0.000	0.000
150.0	4.288%	0.10	0.1559	596.9	732.9	1.2277	1.364	0.000	0.000
160.0	5.856%	0.10	0.2128	654.7	835.9	1.2769	1.437	0.000	0.000
170.0	7.987%	0.10	0.2903	698.5	925.0	1.3244	1.814	0.000	0.000
180.0	1.081%	0.11	0.3927	732.3	1004.2	1.3713	1.7092	0.000	0.000
190.0	1.392%	0.11	0.5060	1076.3	1076.3	1.4179	2.8794	0.000	0.000
200.0	1.708%	0.11	0.6207	780.7	1143.3	1.4627	39.129	0.000	0.000
210.0	2.005%	0.11	0.7286	798.4	1206.3	1.5006	46.642	0.000	0.000
220.0	2.263%	0.11	0.8224	813.0	1266.1	1.5328	52.531	0.000	0.000
230.0	2.468%	0.11	0.8970	825.1	1323.5	1.5604	57.951	0.000	0.000
240.0	2.615%	0.11	0.9503	835.1	1378.9	1.5842	63.480	0.000	0.000
260.0	2.745%	0.11	0.9977	850.4	1484.8	1.6231	75.747	0.000	0.000
280.0	2.739%	0.11	0.9954	861.0	1586.1	1.6536	89.778	0.000	0.000
300.0	2.676%	0.11	0.9726	868.5	1684.1	1.6782	98.000	0.000	0.000
320.0	2.568%	0.11	0.9332	873.7	1780.7	1.6987	98.535	0.000	0.000
340.0	2.424%	0.11	0.8808	877.5	1874.4	1.7162	98.545	0.000	0.000
360.0	2.255%	0.11	0.8197	880.2	1948.6	1.7149	98.543	0.000	0.000
380.0	2.075%	0.11	0.7540	882.2	2003.4	1.6978	98.540	0.000	0.000
400.0	1.891%	0.11	0.6872	883.7	2058.1	1.6833	98.537	0.000	0.000
420.0	1.712%	0.11	0.6222	884.8	2078.0	1.6452	98.528	0.000	0.000
440.0	1.544%	0.11	0.5611	885.6	2098.0	1.6135	98.405	0.000	0.000
460.0	1.390%	0.11	0.5050	886.3	2117.9	1.5874	97.349	0.000	0.000
480.0	1.251%	0.11	0.4545	886.8	2137.9	1.5652	95.830	0.000	0.000
500.0	1.127%	0.11	0.4098	887.2	2157.9	1.5451	94.309	0.000	0.000
520.0	1.020%	0.11	0.3705	887.6	2177.9	1.5263	92.799	0.000	0.000
540.0	9.256%	0.10	0.3364	887.8	2197.9	1.4577	1.5085	0.000	0.000
560.0	8.446%	0.10	0.3069	888.0	2217.9	1.4915	1.4299	0.000	0.000
580.0	7.744%	0.10	0.2815	888.2	2237.9	1.517	1.4752	0.000	0.000
600.0	7.143%	0.10	0.2596	888.4	2257.9	1.547	1.4595	0.000	0.000
620.0	6.626%	0.10	0.2408	888.5	2277.9	1.577	1.4444	0.000	0.000
640.0	6.183%	0.10	0.2247	888.6	2297.9	1.607	1.4299	0.000	0.000
660.0	5.802%	0.10	0.2108	888.7	2317.9	1.637	1.4159	0.000	0.000
680.0	5.474%	0.10	0.1989	888.7	2337.9	1.667	1.4024	0.000	0.000
700.0	5.192%	0.10	0.1887	888.8	2357.9	1.697	1.3894	0.000	0.000
720.0	4.949%	0.10	0.1798	888.9	2377.9	1.727	1.3768	0.000	0.000
740.0	4.738%	0.10	0.1722	888.9	2397.9	1.757	1.3647	0.000	0.000
760.0	4.557%	0.10	0.1656	888.9	2417.9	1.787	1.3547	0.000	0.000
780.0	4.399%	0.10	0.1599	889.0	2437.9	1.817	1.3417	0.000	0.000
800.0	4.263%	0.10	0.1549	889.0	2457.9	1.847	1.3307	0.000	0.000

WE PUT H1= 3.07 GET HST

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MDIP= 55.5 MAGLA= 56.3 XHI= 140.7
 SUNRSE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC= -3.3
 NMF2= 2.90% HMF1= 0.00% HME= 3.20% NMD= 4.00% H
 NMF2= 341.7 HMF1= 0.0 HME= 105.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDH+	RDO+	RDE+	RDU+	RDN+
80.0	5.392%05	1.9%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.473%08	8.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.729%08	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.508%09	0.0086	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.193%09	0.0110	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.201%09	0.0110	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.616%09	0.0090	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.705%09	0.0059	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.085%09	0.0037	319.2	319.2	1.0000	0.000	0.000	0.000	0.000	0.000	0.000
125.0	7.635%08	0.0026	371.2	388.3	0.437	1.0459	0.127	0.000	0.000	0.000	0.000
130.0	6.317%08	0.0022	421.9	456.0	0.421	1.0808	0.205	0.000	0.000	0.000	0.000
135.0	6.212%08	0.0021	470.2	521.3	0.470	1.1088	0.330	0.000	0.000	0.000	0.000
140.0	7.083%08	0.0024	514.3	582.5	0.514	1.1326	0.530	0.000	0.000	0.000	0.000
145.0	1.182%09	0.0264	587.9	690.2	0.587	1.1740	1.365	0.000	0.000	0.000	0.000
150.0	0.0069	0.0401	643.4	779.8	0.643	1.2120	3.439	0.000	0.000	0.000	0.000
160.0	2.000%09	0.0112	779.8	855.6	0.788	1.2488	8.188	0.000	0.000	0.000	0.000
170.0	3.249%09	0.0982	793.5	1134.5	0.811	1.2852	17.101	0.000	0.000	0.000	0.000
180.0	4.991%09	0.0172	717.3	921.9	0.717	1.3214	28.809	0.000	0.000	0.000	0.000
190.0	7.670%09	0.0264	742.7	981.4	0.742	1.3531	39.149	0.000	0.000	0.000	0.000
200.0	1.181%10	0.0407	763.1	1035.9	0.765	1.3531	75.771	0.000	0.000	0.000	0.000
210.0	1.827%10	0.0630	779.8	1086.6	0.788	1.3782	46.665	0.000	0.000	0.000	0.000
220.0	2.850%10	0.0982	793.5	1134.5	0.811	1.3982	52.556	0.000	0.000	0.000	0.000
230.0	4.499%10	0.1551	804.8	1179.9	0.834	1.4144	57.977	0.000	0.000	0.000	0.000
240.0	6.767%10	0.2333	814.3	1223.4	0.857	1.4274	63.506	0.000	0.000	0.000	0.000
260.0	1.273%11	0.4390	828.7	1306.0	0.902	1.4465	75.771	0.000	0.000	0.000	0.000
280.0	1.939%11	0.6686	838.2	948.7	0.948	1.4591	89.795	0.000	0.000	0.000	0.000
300.0	2.490%11	0.8584	845.6	994.4	0.994	1.4676	98.000	0.000	0.000	0.000	0.000
320.0	2.807%11	0.9679	850.6	1532.5	1.040	1.4735	98.507	0.000	0.000	0.000	0.000
340.0	2.900%11	0.9999	854.1	1604.2	1.085	1.4779	98.473	0.000	0.000	0.000	0.000
360.0	2.873%11	0.9906	856.6	1675.0	1.130	1.4817	98.409	0.000	0.000	0.000	0.000
380.0	2.785%11	0.9603	858.5	1745.0	1.174	1.4865	98.303	1.415	0.157	0.005	0.001
400.0	2.648%11	0.9129	859.9	1814.6	1.214	1.4946	97.744	1.983	0.220	0.002	0.001
420.0	2.475%11	0.8532	861.0	1814.7	1.247	1.4947	94.393	5.026	0.558	0.001	0.002
440.0	2.281%11	0.7863	861.8	1814.8	1.270	1.4947	89.978	9.011	1.170	0.130	0.279
460.0	2.079%11	0.7169	862.4	1814.9	1.283	1.4947	85.613	1.416	1.415	0.157	0.119
480.0	1.881%11	0.6486	862.9	1815.0	1.288	1.4947	81.296	1.4084	1.983	0.220	0.051
500.0	1.694%11	0.5842	863.3	1815.0	1.291	1.4947	76.989	1.4059	1.4059	0.220	0.001
520.0	1.523%11	0.5252	863.6	1815.1	1.292	1.4947	72.650	1.4049	1.4049	0.220	0.000
540.0	1.370%11	0.4724	863.8	1815.2	1.292	1.4947	68.251	1.4044	1.4044	0.220	0.000
560.0	1.235%11	0.4259	864.5	1815.3	1.292	1.4947	63.782	1.4042	1.4042	0.220	0.000
580.0	1.118%11	0.3856	864.0	1815.4	1.292	1.4947	59.261	1.4041	1.4041	0.220	0.000
600.0	1.018%11	0.3509	864.3	1815.4	1.293	1.4947	54.736	1.4040	1.4040	0.220	0.000
620.0	9.314%10	0.3211	864.4	1815.5	1.293	1.4947	50.276	1.4040	1.4040	0.220	0.000
640.0	8.579%10	0.2958	864.5	1815.6	1.293	1.4947	45.955	1.4039	1.4039	0.220	0.000
660.0	7.953%10	0.2742	864.6	1815.7	1.293	1.4947	41.836	1.4038	1.4038	0.220	0.000
680.0	7.421%10	0.2559	864.7	1815.8	1.293	1.4947	37.968	1.4038	1.4038	0.220	0.000
700.0	6.969%10	0.2403	864.7	1815.8	1.293	1.4947	34.376	1.4037	1.4037	0.220	0.000
720.0	6.584%10	0.2270	864.8	1815.9	1.293	1.4947	31.074	1.4036	1.4036	0.220	0.000
740.0	6.256%10	0.2157	864.8	1816.0	1.293	1.4947	28.055	1.4035	1.4035	0.220	0.000
760.0	5.977%10	0.2061	864.9	1816.1	1.294	1.4947	25.308	1.4035	1.4035	0.220	0.000
780.0	5.738%10	0.1978	864.9	1816.2	1.294	1.4947	22.817	1.4034	1.4034	0.220	0.000
800.0	5.534%10	0.1908	864.9	1816.2	1.294	1.4947	20.564	1.4033	1.4033	0.220	0.000
WE PUT B1= 3.0TN GET HST											

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH= 6 HUUR=12.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 19.5
 SUNRISE: 4.5 L.T. SUNSET: 19.5 L.T. SUN DEC.= 23.1
 NMF2=4.84%11 NMFI= 3.32%11 NAME=1.73%11 NMD=1.32%09
 HMFI=235.1 HMFI=162.4 HMD=110.0 HMD= 81.0

H	NE	N/NMAX	TN	TE	TI	TE/TI	RD+	RDH+	RDHE+	RD02+	RDND+
80.0	1.257%09	0.0026	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.656%09	0.0055	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.536%10	0.0524	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.639%10	0.1784	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.466%11	0.3026	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.705%11	0.3520	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.729%11	0.3571	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.685%11	0.3480	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.648%11	0.3403	339.1	339.1	339.1	1.0000	1.415	0.000	0.000	38.300	60.284
125.0	1.702%11	0.3515	398.8	423.6	398.8	1.0623	2.024	0.000	0.000	35.454	62.522
130.0	2.142%11	0.4424	457.0	506.7	457.0	1.1087	2.887	0.000	0.000	52.601	46.917
135.0	2.423%11	0.5003	513.3	587.8	513.3	1.1452	4.107	0.000	0.000	46.888	52.421
140.0	2.632%11	0.5435	566.2	665.6	566.2	1.1755	5.809	0.000	0.000	42.097	56.914
150.0	3.012%11	0.6218	658.8	807.8	658.8	1.2263	11.251	0.000	0.000	30.000	12.191
160.0	3.326%11	0.6867	932.2	933.4	932.2	1.2710	19.962	0.000	0.000	27.223	61.525
170.0	3.636%11	0.7508	1041.3	792.9	792.9	1.3134	30.669	0.000	0.000	24.706	55.332
180.0	4.006%11	0.8270	840.5	1138.6	840.5	1.3547	40.806	0.000	0.000	22.264	47.066
190.0	4.310%11	0.8898	879.2	1227.0	879.2	1.3956	49.733	0.000	0.000	19.094	40.100
200.0	4.542%11	0.9377	911.0	1308.5	911.0	1.4363	58.351	0.000	0.000	30.000	12.835
210.0	4.702%11	0.9709	937.3	1384.5	937.3	1.4771	67.504	0.000	0.000	5.437	36.212
220.0	4.798%11	0.9906	959.3	1456.2	959.3	1.5180	77.593	0.000	0.000	1.805	30.691
230.0	4.839%11	0.9991	977.6	1524.1	977.6	1.5591	88.070	0.000	0.000	0.570	21.837
240.0	4.840%11	0.9993	992.8	1589.1	993.4	1.5996	95.635	0.000	0.000	0.179	11.752
260.0	4.763%11	0.9835	1016.2	1711.9	1024.8	1.6704	98.527	0.000	0.000	0.056	4.309
280.0	4.594%11	0.9485	1032.5	1827.5	1056.2	1.7302	98.595	0.000	0.000	0.006	1.467
300.0	4.349%11	0.8980	1044.0	1938.4	1087.7	1.7821	98.596	0.000	0.000	0.001	1.404
320.0	4.050%11	0.8363	1052.0	2045.8	1119.1	1.8280	98.596	0.000	0.000	0.000	0.588
340.0	3.720%11	0.7680	1057.8	2151.0	1150.7	1.8692	98.594	1.212	0.135	0.000	0.058
360.0	3.377%11	0.6973	1062.0	2222.6	1182.7	1.8793	98.593	1.266	0.140	0.000	0.006
380.0	3.040%11	0.6276	1065.1	2262.2	1215.5	1.8612	98.590	1.269	0.141	0.000	0.001
400.0	2.719%11	0.5614	1067.3	2302.0	1250.4	1.8410	98.586	1.272	0.141	0.000	0.000
420.0	2.423%11	0.5004	1069.1	2341.8	1289.6	1.8160	98.578	1.280	0.142	0.000	0.000
440.0	2.156%11	0.4452	1070.4	2381.7	1335.2	1.7837	98.454	1.391	0.155	0.000	0.000
460.0	1.920%11	0.3964	1071.4	2421.6	1387.4	1.7455	97.398	2.342	0.260	0.000	0.000
480.0	1.712%11	0.3535	1072.2	2461.5	1443.8	1.7049	95.879	3.709	0.412	0.000	0.000
500.0	1.533%11	0.3164	1072.8	2501.5	1502.4	1.6650	94.357	5.079	0.564	0.000	0.000
520.0	1.378%11	0.2844	1073.3	2541.4	1561.8	1.6273	92.846	6.438	0.715	0.000	0.000
540.0	1.245%11	0.2570	1073.7	2581.4	1621.5	1.6737	91.342	7.793	0.866	0.000	0.000
560.0	1.131%11	0.2335	1074.1	2621.4	1681.4	1.5591	89.836	9.148	1.016	0.000	0.000
580.0	1.034%11	0.2135	1074.4	2661.3	1741.3	1.5284	88.318	10.514	1.168	0.000	0.000
600.0	9.510%10	0.1963	1074.6	2701.3	1801.2	1.4997	86.776	11.902	1.322	0.000	0.000
620.0	8.801%10	0.1817	1074.8	2741.2	1861.1	1.4729	85.194	13.326	1.481	0.000	0.000
640.0	8.194%10	0.1692	1074.9	2781.2	1921.1	1.4477	83.554	14.801	1.645	0.000	0.000
660.0	7.674%10	0.1585	1075.1	2821.1	1981.0	1.4241	81.841	16.344	1.816	0.000	0.000
680.0	7.228%10	0.1492	1075.2	2861.1	2040.9	1.4019	80.040	17.964	1.996	0.000	0.000
700.0	6.844%10	0.1413	1075.3	2901.1	2100.9	1.3809	78.147	19.668	2.185	0.000	0.000
720.0	6.513%10	0.1345	1075.4	2941.0	2160.8	1.3611	76.169	21.448	2.383	0.000	0.000
740.0	6.226%10	0.1286	1075.4	2981.0	2220.7	1.3423	74.121	23.292	2.588	0.000	0.000
760.0	5.979%10	0.1234	1075.5	3020.9	2280.7	1.3246	72.025	25.177	2.797	0.000	0.000
780.0	5.764%10	0.1190	1075.5	3060.9	2340.6	1.3077	69.908	27.083	3.009	0.000	0.000
800.0	5.577%10	0.1151	1075.6	3100.8	2400.6	1.2917	67.792	28.987	3.221	0.000	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH= 6 HOUR= 4.5

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MDIP= 55.5 MAGLA= 56.3 XHI= 90.0
 SUNRISE= 4:05 L.T. SUNSET= 19:55 L.T. SUN DEC.= 23.1
 NMHF2= 2.12% HME1= 0.00%-01 NME3= 85%10 NMD= 4.00%08
 HME2= 2.77% HME1= 0.00% HME= 107.5 HMD= 84.5

RDNO+		RDNO+		RDHE+		RDHE+	
T	E	T	E	T	E	T	E
N/NMAX	NE	N/NMAX	NE	N/NMAX	NE	N/NMAX	NE
0.0013	2.814%	0.0013	2.814%	0.0013	2.814%	0.0013	2.814%
0.0019	4.102%	0.0019	4.102%	0.0019	4.102%	0.0019	4.102%
0.0086	1.815%	0.0086	1.815%	0.0086	1.815%	0.0086	1.815%
0.0582	1.233%	0.0582	1.233%	0.0582	1.233%	0.0582	1.233%
0.1409	1.983%	0.1409	1.983%	0.1409	1.983%	0.1409	1.983%
0.1799	3.808%	0.1799	3.808%	0.1799	3.808%	0.1799	3.808%
0.1760	3.727%	0.1760	3.727%	0.1760	3.727%	0.1760	3.727%
0.1467	3.106%	0.1467	3.106%	0.1467	3.106%	0.1467	3.106%
0.1811	2.500%	0.1811	2.500%	0.1811	2.500%	0.1811	2.500%
0.2139	2.213%	0.2139	2.213%	0.2139	2.213%	0.2139	2.213%
0.1045	4.039%	0.1045	4.039%	0.1045	4.039%	0.1045	4.039%
0.1079	2.284%	0.1079	2.284%	0.1079	2.284%	0.1079	2.284%
0.1799	5.181%	0.1799	5.181%	0.1799	5.181%	0.1799	5.181%
0.1760	6.657%	0.1760	6.657%	0.1760	6.657%	0.1760	6.657%
0.1467	8.566%	0.1467	8.566%	0.1467	8.566%	0.1467	8.566%
0.5041	1.067%	0.5041	1.067%	0.5041	1.067%	0.5041	1.067%
0.6049	1.281%	0.6049	1.281%	0.6049	1.281%	0.6049	1.281%
0.7013	1.485%	0.7013	1.485%	0.7013	1.485%	0.7013	1.485%
0.6982	1.669%	0.6982	1.669%	0.6982	1.669%	0.6982	1.669%
0.8615	1.824%	0.8615	1.824%	0.8615	1.824%	0.8615	1.824%
0.9190	1.946%	0.9190	1.946%	0.9190	1.946%	0.9190	1.946%
0.9855	2.087%	0.9855	2.087%	0.9855	2.087%	0.9855	2.087%
0.9998	2.117%	0.9998	2.117%	0.9998	2.117%	0.9998	2.117%
0.9878	2.092%	0.9878	2.092%	0.9878	2.092%	0.9878	2.092%
0.9016	2.029%	0.9016	2.029%	0.9016	2.029%	0.9016	2.029%
0.9140	1.935%	0.9140	1.935%	0.9140	1.935%	0.9140	1.935%
0.8590	1.819%	0.8590	1.819%	0.8590	1.819%	0.8590	1.819%
0.7972	1.688%	0.7972	1.688%	0.7972	1.688%	0.7972	1.688%
0.7326	1.551%	0.7326	1.551%	0.7326	1.551%	0.7326	1.551%
0.6681	1.415%	0.6681	1.415%	0.6681	1.415%	0.6681	1.415%
0.6062	1.284%	0.6062	1.284%	0.6062	1.284%	0.6062	1.284%
0.5486	1.162%	0.5486	1.162%	0.5486	1.162%	0.5486	1.162%
0.4960	1.050%	0.4960	1.050%	0.4960	1.050%	0.4960	1.050%
0.4489	9.505%	0.4489	9.505%	0.4489	9.505%	0.4489	9.505%
0.2879	6.097%	0.2879	6.097%	0.2879	6.097%	0.2879	6.097%
0.4073	8.623%	0.4073	8.623%	0.4073	8.623%	0.4073	8.623%
0.3708	7.851%	0.3708	7.851%	0.3708	7.851%	0.3708	7.851%
0.3391	7.179%	0.3391	7.179%	0.3391	7.179%	0.3391	7.179%
0.3116	6.599%	0.3116	6.599%	0.3116	6.599%	0.3116	6.599%
0.2219	4.698%	0.2219	4.698%	0.2219	4.698%	0.2219	4.698%
0.2107	4.461%	0.2107	4.461%	0.2107	4.461%	0.2107	4.461%
0.2016	4.256%	0.2016	4.256%	0.2016	4.256%	0.2016	4.256%
0.1926	4.079%	0.1926	4.079%	0.1926	4.079%	0.1926	4.079%
0.1854	3.926%	0.1854	3.926%	0.1854	3.926%	0.1854	3.926%
0.1792	3.793%	0.1792	3.793%	0.1792	3.793%	0.1792	3.793%
0.1737	3.679%	0.1737	3.679%	0.1737	3.679%	0.1737	3.679%

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9

DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 114.3
 SUNRISE: 4.5 L.T. SUNSET: 19.5 L.T. SUN DEC.= 23.1
 NMF2= 2.98% NMF1= 0.00%-01 NMEE= 3.20% NMDF= 4.00%
 HMF2= 333.3 HMF1= 0.0 HME= 105.1 HMD= 87.9

H	NE	TN	TE	T1	TE/T1	RDN+	RDN*	RDO2+	RDO2*	RDHE+	RDHE*
80.0	8.809%05	3.0%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.578%08	8.7%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.777%08	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.533%09	0.0085	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.194%09	0.0107	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.201%09	0.0108	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.631%09	0.0088	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.726%09	0.0058	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.107%09	0.0037	-1	-1	-1	-1	-1	-1	-1	-1	-1
125.0	7.850%08	0.0026	377.6	393.9	377.6	1.0433	0.160	0.000	0.000	21.966	93.361
130.0	6.536%08	0.0022	430.0	462.7	430.0	1.0761	0.252	0.000	0.000	8.541	91.434
135.0	6.455%08	0.0022	480.1	529.2	480.1	1.1022	0.397	0.000	0.000	10.994	88.966
140.0	7.372%08	0.0025	526.3	591.7	526.3	1.1244	0.623	0.000	0.000	14.085	85.852
150.0	1.223%09	0.0041	604.1	702.3	604.1	1.1625	1.499	0.000	0.000	17.829	82.070
160.0	2.047%09	0.0069	663.7	794.5	663.7	1.1972	3.369	0.000	0.000	31.523	63.108
170.0	3.477%09	0.0117	709.1	872.7	709.1	1.2307	6.682	0.000	0.000	31.631	61.688
180.0	8.236%09	0.0277	744.4	940.7	744.4	1.2638	11.440	0.000	0.000	30.463	58.096
190.0	1.628%10	0.0547	772.3	1001.4	772.3	1.2966	17.675	0.000	0.000	31.125	67.376
200.0	2.816%10	0.0946	795.0	1056.8	795.0	1.3290	26.016	0.000	0.000	31.998	60.985
210.0	4.404%10	0.1480	813.5	1108.0	816.8	1.3566	37.577	0.000	0.000	5.759	56.664
220.0	6.454%10	0.2169	828.8	1156.0	838.4	1.3789	53.695	0.000	0.000	2.450	43.855
230.0	8.964%10	0.3012	841.4	1201.4	860.0	1.3970	74.407	0.000	0.000	1.036	24.556
240.0	1.185%11	0.3981	852.0	1244.6	881.6	1.4118	92.029	0.000	0.000	0.438	7.533
260.0	1.811%11	0.6086	868.0	1326.2	924.8	1.4340	99.254	0.000	0.000	0.078	0.667
280.0	2.379%11	0.7994	879.2	1402.8	968.0	1.4491	97.970	0.000	0.000	0.014	0.151
300.0	2.769%11	0.9306	887.0	1476.0	1011.2	1.4597	95.560	0.000	0.000	0.002	0.025
320.0	2.949%11	0.9911	892.5	1547.0	1054.3	1.4673	93.146	0.000	0.000	0.000	0.000
340.0	2.972%11	0.9987	896.5	1616.4	1097.2	1.4732	90.774	0.000	0.000	0.000	0.000
360.0	2.918%11	0.9804	899.3	1684.7	1139.6	1.4783	88.437	0.000	0.000	0.000	0.000
380.0	2.805%11	0.9427	901.4	1752.2	1180.8	1.4840	86.124	0.000	0.000	0.000	0.000
400.0	2.648%11	0.8898	903.0	1819.2	1218.8	1.4927	83.819	0.000	0.000	0.000	0.000
420.0	2.460%11	0.8267	904.2	1819.7	1250.4	1.4953	81.500	0.000	0.000	0.000	0.000
440.0	2.257%11	0.7583	905.1	1820.2	1272.4	1.4972	79.150	0.000	0.000	0.000	0.000
460.0	2.050%11	0.6890	905.8	1820.6	1284.6	1.4972	76.705	0.000	0.000	0.000	0.000
480.0	1.851%11	0.6219	906.3	1821.1	1290.5	1.4911	74.146	0.000	0.000	0.000	0.000
500.0	1.665%11	0.5594	906.7	1821.5	1293.3	1.4984	71.414	0.000	0.000	0.000	0.000
520.0	1.496%11	0.5026	907.1	1822.0	1294.8	1.4972	68.456	0.000	0.000	0.000	0.000
540.0	1.345%11	0.4521	907.4	1822.4	1295.8	1.4964	65.232	0.000	0.000	0.000	0.000
560.0	1.214%11	0.4079	907.6	1822.9	1296.6	1.4959	61.723	0.000	0.000	0.000	0.000
580.0	1.100%11	0.3695	907.8	1823.4	1297.3	1.4955	57.954	0.000	0.000	0.000	0.000
600.0	1.002%11	0.3366	907.9	1823.8	1298.0	1.4951	53.987	0.000	0.000	0.000	0.000
620.0	9.179%10	0.3084	908.0	1824.3	1298.7	1.4947	49.918	0.000	0.000	0.000	0.000
640.0	8.464%10	0.2844	908.2	1824.7	1299.4	1.4943	45.857	0.000	0.000	0.000	0.000
660.0	7.855%10	0.2640	908.2	1825.2	1300.1	1.4939	41.900	0.000	0.000	0.000	0.000
680.0	7.337%10	0.2466	908.3	1825.6	1300.8	1.4935	38.126	0.000	0.000	0.000	0.000
700.0	6.897%10	0.2317	908.4	1826.1	1301.4	1.4931	34.584	0.000	0.000	0.000	0.000
720.0	6.521%10	0.2191	908.4	1826.6	1302.1	1.4927	31.300	0.000	0.000	0.000	0.000
740.0	6.201%10	0.2084	908.5	1827.0	1302.8	1.4924	28.283	0.000	0.000	0.000	0.000
760.0	5.928%10	0.1992	908.5	1827.5	1303.5	1.4920	25.529	0.000	0.000	0.000	0.000
780.0	5.694%10	0.1913	908.6	1827.9	1304.2	1.4916	23.026	0.000	0.000	0.000	0.000
800.0	5.494%10	0.1846	908.6	1828.4	1304.9	1.4912	20.757	0.000	0.000	0.000	0.000

WEPUT B1= 3.0TU GET HST

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 54.0 MAGLA= 56.3 XHI= 65.5
 DIP= 71.5 MODIP= 55.5 SUNSET:16.5 L.T. SUN DEC.= -22.9
 SUNRISE: 7.5 L.T. NMF1= 0.00% HME=1.17% NMD=5.05%
 NMF2=1.39% HMF1= 0.00% HME=109.9 HMD= 81.2
 HMF2=248.8 HME=109.9 HMD= 81.2

H	NE	TN	TE	T1	TE/T1	RDD+	RDH+	RDD+	RDH+	RDN+	RDN+
80.0	4.765%0B	3.4%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	9.534%0B	6.8%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	9.952%09	0.0071	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	4.225%10	0.0303	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	8.737%10	0.0627	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.131%11	0.0812	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.171%11	0.0840	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.103%11	0.0792	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.043%11	0.0748	333.0	333.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125.0	1.143%11	0.0798	390.2	416.3	1.0668	2.005	0.0000	0.0000	0.0000	39.222	60.381
130.0	1.239%11	0.0889	446.1	498.3	1.1169	2.999	0.0000	0.0000	0.0000	41.142	58.263
135.0	1.366%11	0.0980	499.9	578.2	1.1565	4.475	0.0000	0.0000	0.0000	43.093	56.014
140.0	1.511%11	0.1084	550.1	554.5	1.1897	6.652	0.0000	0.0000	0.0000	44.970	53.691
150.0	1.872%11	0.1342	636.7	793.2	1.2458	14.332	0.0000	0.0000	0.0000	46.514	51.481
160.0	2.380%11	0.1707	705.0	913.7	1.2960	28.637	0.0000	0.0000	0.0000	47.251	49.4750
170.0	3.210%11	0.2303	758.5	1019.3	1.3439	48.995	0.0000	0.0000	0.0000	46.727	48.797
180.0	4.890%11	0.3508	800.8	1113.8	1.3909	67.894	0.0000	0.0000	0.0000	45.000	48.348
190.0	6.934%11	0.4974	834.8	1199.9	1.4374	79.315	0.0000	0.0000	0.0000	39.856	45.812
200.0	9.026%11	0.6475	862.5	1279.8	1.4839	84.800	0.0000	0.0000	0.0000	33.772	37.592
210.0	1.091%12	0.7826	885.4	1354.8	1.5303	87.531	0.0000	0.0000	0.0000	24.839	26.166
220.0	1.238%12	0.8883	904.3	1426.0	1.5765	89.237	0.0000	0.0000	0.0000	13.925	18.182
230.0	1.335%12	0.9577	920.1	1493.9	1.6186	90.597	0.0000	0.0000	0.0000	0.323	13.947
240.0	1.383%12	0.9922	933.2	1559.2	1.6563	91.851	0.0000	0.0000	0.0000	0.151	7.998
260.0	1.388%12	0.9959	953.3	1683.6	1.6825	94.308	0.0000	0.0000	0.0000	0.033	5.659
280.0	1.352%12	0.9695	967.3	1801.9	1.7751	96.728	0.0000	0.0000	0.0000	0.007	3.264
300.0	1.285%12	0.9218	977.1	1916.1	1.8213	98.000	0.0000	0.0000	0.0000	0.002	1.998
320.0	1.196%12	0.8580	984.0	2027.3	1.8617	98.079	0.0000	0.0000	0.0000	0.000	1.921
340.0	1.093%12	0.7840	989.0	2136.6	1.8975	98.079	0.0000	0.0000	0.0000	0.000	0.932
360.0	9.835%11	0.7054	992.5	2210.7	1.9004	98.078	0.0000	0.0000	0.0000	0.000	0.203
380.0	8.743%11	0.6271	995.2	2251.0	1.9212	98.075	1.693	0.0000	0.0000	0.000	0.044
400.0	7.703%11	0.5525	997.1	2291.5	1.9408	98.071	1.727	0.0000	0.0000	0.000	0.010
420.0	6.747%11	0.4840	998.6	2329.5	1.958	98.063	1.741	0.0000	0.0000	0.000	0.002
440.0	5.892%11	0.4226	999.7	2369.5	1.979	97.940	1.854	0.0000	0.0000	0.000	0.000
460.0	5.142%11	0.3689	1000.6	2408.5	1.984	96.889	2.800	0.0000	0.0000	0.000	0.000
480.0	4.495%11	0.3224	1001.3	2447.6	1.997	95.378	4.160	0.0000	0.0000	0.000	0.000
500.0	3.943%11	0.2828	1001.8	2486.7	1.9976	94.864	5.522	0.614	0.0000	0.000	0.000
520.0	3.474%11	0.2492	1002.3	2525.8	1.9958	92.361	6.875	0.764	0.0000	0.000	0.000
540.0	3.079%11	0.2209	1002.6	2564.9	1.9943	90.864	8.222	0.914	0.0000	0.000	0.000
560.0	2.747%11	0.1971	1002.9	2604.0	1.9979	89.366	9.570	1.063	0.0000	0.000	0.000
580.0	2.468%11	0.1771	1003.1	2643.1	1.9961	87.857	10.929	1.214	0.0000	0.000	0.000
600.0	2.234%11	0.1602	1003.3	2682.2	1.9972	86.323	12.310	1.368	0.0000	0.000	0.000
620.0	2.036%11	0.1461	1003.5	2721.3	1.9987	84.749	13.726	1.525	0.0000	0.000	0.000
640.0	1.870%11	0.1341	1003.6	2760.4	1.9975	83.118	15.194	1.688	0.0000	0.000	0.000
660.0	1.729%11	0.1240	1003.7	2799.5	1.9961	81.413	16.728	1.859	0.0000	0.000	0.000
680.0	1.610%11	0.1155	1003.8	2838.6	1.9948	79.62	18.341	2.038	0.0000	0.000	0.000
700.0	1.508%11	0.1082	1003.9	2877.7	1.9834	77.739	20.035	2.226	0.0000	0.000	0.000
720.0	1.422%11	0.1020	1004.0	2916.8	1.9742	75.771	21.806	2.423	0.0000	0.000	0.000
740.0	1.348%11	0.0967	1004.1	2955.9	2.0007	73.733	23.640	2.627	0.0000	0.000	0.000
760.0	1.284%11	0.0921	1004.1	2995.0	2.0256	71.649	25.516	2.835	0.0000	0.000	0.000
780.0	1.230%11	0.0882	1004.2	3034.1	2.0381	69.543	27.411	3.046	0.0000	0.000	0.000
800.0	1.183%11	0.0848	1004.2	3073.2	2.0419	67.438	29.306	3.256	0.0000	0.000	0.000

WE PUT Bl= 3.0TU GET LIST

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH=12 HOUR= 7.5

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DTP= 71.5 MUNIP= 55.5 MAGLA= 56.3 XHI= 90.0
 SUNRISE: 7:5 L.T. SUNSET:16.5 L.T. SUN DEC.= -22.9
 NMF2=4.34%11 HNF1= 0.00%01 NMEE=4.26%10 NID=4.00%08
 HMF2=257.6 HNF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDDHE+	RDD0+	RDN0+
80.0	2.813%08	6.5%-4	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.102%08	9.4%-4	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.816%09	0.0042	-1	-1	-1	-1	-1	-1	-1	-1
95.0	0.1.272%10	0.0293	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.217%10	0.0741	-1	-1	-1	-1	-1	-1	-1	-1
105.0	4.213%10	0.0542	-1	-1	-1	-1	0.003	0.000	17.568	82.429
110.0	4.124%10	0.0970	0.0561	426.8	472.0	1.0602	0.084	0.000	20.399	79.595
115.0	3.398%10	0.0950	0.0646	476.2	544.0	426.8	1.1058	0.000	23.675	76.313
120.0	2.690%10	0.0782	0.0758	521.6	611.9	476.2	1.1422	0.000	27.442	72.535
125.0	2.355%10	0.0619	0.1040	597.8	733.2	322.0	1.0000	0.000	31.698	68.258
130.0	2.437%10	0.0542	0.1448	655.7	836.3	397.7	1.375.1	0.000	36.294	63.621
135.0	2.804%10	0.2058	0.2058	699.7	925.5	699.7	1.3227	0.000	40.716	59.123
140.0	2.290%10	0.0758	0.4355	733.8	1004.7	733.8	1.3692	0.307	43.939	55.754
145.0	4.516%10	0.5760	1.1432	782.4	1143.7	782.4	1.4155	0.584	0.000	45.000
150.0	6.290%10	0.1448	0.7112	800.2	1206.6	805.3	1.4602	0.000	41.880	56.046
155.0	3.088%11	0.8269	0.8269	814.8	1266.4	827.5	1.4982	0.000	36.631	56.461
160.0	1.891%11	0.9140	0.9044	827.0	1323.7	849.6	1.5305	0.000	30.703	49.636
165.0	2.502%11	0.664%11	0.8437	837.1	1378.9	871.7	1.5580	0.000	21.641	36.474
170.0	4.342%11	0.9998	0.9998	852.5	1484.6	916.0	1.6208	0.000	10.559	25.653
175.0	4.284%11	0.9865	0.9865	863.2	1585.6	960.2	1.6514	0.000	4.137	18.896
180.0	4.141%11	0.9535	0.9535	870.6	1683.4	1004.4	1.6760	0.000	1.545	15.167
185.0	3.928%11	0.9044	0.9044	875.9	1779.0	1048.7	1.6965	0.000	0.573	12.931
190.0	3.664%11	0.5699	0.8437	879.7	1873.1	1092.8	1.7140	0.000	0.212	11.228
195.0	3.370%11	0.7760	0.7760	882.4	1947.5	1136.8	1.7131	0.000	0.079	9.679
200.0	3.064%11	0.7056	0.6360	884.4	2002.8	1180.3	1.6968	0.000	0.011	6.630
205.0	2.762%11	0.6360	0.5699	885.9	2058.0	1222.8	1.6830	0.000	0.001	3.600
210.0	2.475%11	0.5699	0.5088	887.1	2077.9	1263.2	1.6450	0.000	0.000	2.000
215.0	2.210%11	0.475%11	0.442%11	887.9	2097.9	1300.3	1.6134	0.000	1.900	1.900
220.0	1.971%11	0.4538	0.4538	888.6	2117.9	1334.2	1.5874	0.000	0.116	0.739
225.0	1.759%11	0.4050	0.4226	889.1	2137.9	1366.0	1.5651	0.000	0.180	0.101
230.0	1.573%11	0.3622	0.3252	889.5	2157.8	1396.6	1.5450	0.000	0.189	0.101
235.0	1.412%11	0.3252	0.274%11	889.8	2177.8	1426.9	1.5263	0.000	0.191	0.191
240.0	1.274%11	0.2933	0.2933	890.1	2197.8	1457.0	1.5085	0.000	0.192	0.192
245.0	1.155%11	0.2660	0.2660	890.3	2217.8	1487.0	1.4915	0.000	0.204	0.204
250.0	1.054%11	0.2426	0.1786	890.5	2237.8	1517.0	1.4751	0.000	0.309	0.309
255.0	9.668%10	0.2226	0.1679	891.0	2257.8	1547.0	1.4595	0.000	0.460	0.460
260.0	8.928%10	0.2056	0.1509	891.1	2277.8	1577.0	1.4444	0.000	0.612	0.612
265.0	8.296%10	0.1910	0.1441	891.2	2297.8	1607.0	1.4299	0.000	0.800	0.800
270.0	7.755%10	0.1786	0.1382	891.3	2317.8	1637.0	1.4159	0.000	0.953	1.061
275.0	7.292%10	0.1679	0.1332	891.3	2337.8	1667.0	1.4024	0.000	1.212	1.212
280.0	6.894%10	0.1588	0.1288	891.3	2357.8	1697.0	1.3894	0.000	1.325	1.325
285.0	6.553%10	0.1509	0.1288	891.3	2377.8	1727.0	1.3768	0.000	1.523	1.523
290.0	6.258%10	0.1441	0.1288	891.2	2397.8	1757.0	1.3647	0.000	1.686	1.686
295.0	6.004%10	0.1382	0.1332	891.3	2417.8	1787.0	1.3530	0.000	1.847	1.847
300.0	5.784%10	0.1332	0.1332	891.3	2437.8	1817.0	1.3417	0.000	2.036	2.036
305.0	5.594%10	0.1288	0.1288	891.3	2457.8	1847.0	1.3307	0.000	2.224	2.224
310.0	5.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
315.0	3.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
320.0	2.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
325.0	1.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
330.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
335.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
340.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
345.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
350.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
355.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
360.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
365.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
370.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
375.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
380.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
385.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
390.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
395.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
400.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
405.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
410.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
415.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
420.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
425.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
430.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
435.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
440.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
445.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
450.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
455.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
460.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
465.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
470.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
475.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
480.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
485.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
490.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
495.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
505.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
510.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
515.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
520.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
525.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
530.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
535.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
540.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
545.0	0.000%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
550.0	0.000%	0.000	0.000	0.0						

INPUT: LATI= 42.6 LONGI= 288.5 R=100 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= 54.0 MLNG= 357.9
 DIP= 71.5 MODIP= 55.5 MAGLA= 56.3 XHI= 160.3
 SUNR/SE: 7.5 L.T. SUNSET: 16.5 L.T. SUN DEC.= -22.9
 NMF2=2.21%11 NMFL1= 0.00% -0.1 NMFL2=3.20%09 NMFD=4.00%08
 HMF2=329.2 HMF1= 0.0 HME=105.0 HMD= 88.0

		TE	T1	TE/T1	RDD+	RDH+	RDD2+	RDH2+	RDN0+	RDN0+
H	NE	N/NMAX	-1	-1	-1	-1	-1	-1	-1	-1
80.0	4.972%05	2.2%-6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.456%08	0.0011	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.721%08	0.0021	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.504%09	0.0113	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.193%09	0.0144	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.201%09	0.0145	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.614%09	0.0118	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.701%09	0.0077	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.081%09	0.0049	317.3	317.3	1.0000	0.000	0.000	0.000	17.568	82.429
125.0	7.600%08	0.0034	368.6	368.6	1.0470	0.084	0.000	0.000	20.399	79.595
130.0	6.282%08	0.0028	418.6	453.3	1.0828	0.161	0.000	0.000	23.675	76.313
135.0	6.174%08	0.0028	466.1	518.1	1.1116	0.307	0.000	0.012	27.442	72.535
140.0	7.037%05	0.0032	509.5	578.8	1.1361	0.584	0.000	0.023	0.000	68.258
150.0	1.175%09	0.0053	581.4	685.4	1.1789	2.075	0.000	0.000	41.880	56.044
160.0	1.992%09	0.0090	635.2	773.9	1.2183	6.912	0.000	0.000	36.631	56.457
170.0	3.362%09	0.0152	675.6	848.9	1.2566	19.672	0.000	0.000	43.939	49.625
180.0	4.718%09	0.0213	706.6	914.6	1.2944	41.907	0.000	0.000	21.641	36.451
190.0	6.676%09	0.0302	730.9	973.6	1.3315	63.821	0.000	0.000	10.559	25.620
200.0	9.560%09	0.0432	750.5	1027.9	1.3622	77.006	0.000	0.000	4.137	18.857
210.0	1.394%10	0.0630	766.5	1078.5	1.3864	83.329	0.000	0.000	1.545	15.125
220.0	2.092%10	0.0946	779.6	1126.3	1.4056	86.537	0.000	0.000	0.573	12.890
230.0	3.335%10	0.1508	790.5	1171.9	1.4210	88.599	0.000	0.000	0.212	11.188
240.0	5.293%10	0.2393	799.5	1215.6	1.4334	90.280	0.000	0.000	0.079	9.641
250.0	8.205%11	0.4771	813.3	1298.7	1.4514	93.390	0.000	0.000	0.011	6.599
260.0	1.055%11	0.9758	840.0	1377.5	1.4632	96.417	0.000	0.000	0.001	3.582
280.0	1.619%11	0.9318	822.8	1722.1	1.4710	98.000	0.000	0.000	2.000	2.000
300.0	2.026%11	0.9160	829.5	1453.6	1.4763	98.071	0.000	0.000	0.000	1.231
320.0	2.198%11	0.9936	834.2	1527.6	1.4802	98.030	0.000	0.000	0.000	0.169
340.0	2.205%11	0.9969	837.6	1600.3	1.4837	97.965	0.000	0.000	0.000	0.023
360.0	2.158%11	0.9758	840.0	1672.1	1.4881	97.860	0.000	0.000	0.000	0.003
380.0	2.072%11	0.9370	841.8	1743.2	1.4961	97.304	0.000	0.000	0.000	0.000
400.0	1.957%11	0.8846	843.1	1813.9	1.4953	93.968	0.000	0.000	0.000	0.000
420.0	1.821%11	0.8232	844.1	1813.9	1.4953	93.968	0.000	0.000	0.000	0.000
440.0	1.675%11	0.7573	844.9	1814.0	1.4953	93.968	0.000	0.000	0.000	0.000
460.0	1.528%11	0.6907	845.5	1814.0	1.4953	93.968	0.000	0.000	0.000	0.000
480.0	1.385%11	0.6264	846.0	1814.0	1.4953	93.968	0.000	0.000	0.000	0.000
500.0	1.253%11	0.5663	846.3	1814.0	1.4953	93.968	0.000	0.000	0.000	0.000
520.0	1.132%11	0.5117	846.6	1814.0	1.4953	93.968	0.000	0.000	0.000	0.000
540.0	1.024%11	0.4629	846.9	1814.1	1.4953	93.968	0.000	0.000	0.000	0.000
560.0	9.290%10	0.4220	847.0	1814.1	1.4953	93.968	0.000	0.000	0.000	0.000
580.0	8.464%10	0.3822	847.2	1814.1	1.4953	93.968	0.000	0.000	0.000	0.000
600.0	7.751%10	0.3504	847.3	1814.1	1.4953	93.968	0.000	0.000	0.000	0.000
620.0	7.138%10	0.3227	847.5	1814.1	1.4953	93.968	0.000	0.000	0.000	0.000
640.0	6.613%10	0.2990	847.5	1814.2	1.4953	93.968	0.000	0.000	0.000	0.000
660.0	6.163%10	0.2787	847.6	1814.2	1.4953	93.968	0.000	0.000	0.000	0.000
680.0	5.780%10	0.2613	847.7	1814.2	1.4953	93.968	0.000	0.000	0.000	0.000
700.0	5.452%10	0.2465	847.7	1814.2	1.4953	93.968	0.000	0.000	0.000	0.000
720.0	5.171%10	0.2338	847.8	1814.3	1.4953	93.968	0.000	0.000	0.000	0.000
740.0	4.931%10	0.2230	847.8	1814.3	1.4953	93.968	0.000	0.000	0.000	0.000
760.0	4.726%10	0.2137	847.9	1814.3	1.4953	93.968	0.000	0.000	0.000	0.000
780.0	4.549%10	0.2057	847.9	1814.3	1.4953	93.968	0.000	0.000	0.000	0.000
800.0	4.398%10	0.1988	847.9	1814.3	1.4953	93.968	0.000	0.000	0.000	0.000

WE PUT Bl= 3.0TD GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 HAGLA= 40.5 XHI= 47.4
 SUNRISE: 6.2 L.T. SUNSET:17.8 L.T. SUN DEC.= -3.3
 NMF2=4.58% 11 NMFL1= 2.15% 11 NMEE1=1.14%11 NMD=5.20%8
 HMFL2=243.9 HMFL1=184.0 HMEE=110.0 HMD= 81.0

H	NIE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDHE+	RDD2+	RDN+
80.0	4.945%08	0.0011	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.029%09	0.0022	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.066%10	0.0233	-1	-1	-1	-1	-1	-1	-1	-1
95.0	4.351%10	0.0950	-1	-1	-1	-1	-1	-1	-1	-1
100.0	8.694%10	0.1899	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.105%11	0.2412	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.139%11	0.2488	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.105%11	0.2412	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.084%11	0.2366	304.9	304.9	1.0000	1.0000	0.000	0.000	53.129	46.664
125.0	1.122%11	0.2451	351.4	380.4	351.4	1.0823	1.979	0.000	0.000	52.315
130.0	1.171%11	0.2557	396.6	454.5	396.6	1.1459	3.076	0.000	0.000	47.359
135.0	1.200%11	0.2620	439.2	526.0	439.2	1.1977	4.736	0.000	0.000	51.435
140.0	1.232%11	0.2690	477.3	593.0	477.3	1.2425	7.175	0.000	0.000	48.051
150.0	1.311%11	0.2863	538.4	712.0	538.4	1.3225	15.113	0.000	0.000	48.818
160.0	1.423%11	0.3107	582.3	813.8	582.3	1.3976	26.363	0.000	0.000	50.375
170.0	1.637%11	0.3575	614.2	903.6	614.2	1.4712	36.882	0.000	0.000	43.822
180.0	2.086%11	0.4555	638.2	985.5	638.2	1.5431	44.217	0.000	0.000	40.443
190.0	2.573%11	0.5618	656.8	1061.9	661.8	1.6046	49.297	0.000	0.000	54.821
200.0	3.248%11	0.7093	671.6	1134.6	685.0	1.6563	53.471	0.000	0.000	55.825
210.0	3.821%11	0.8343	683.6	1204.5	708.2	1.7008	57.448	0.000	0.000	54.209
220.0	4.235%11	0.9248	693.5	1272.2	731.4	1.7394	61.526	0.000	0.000	48.302
230.0	4.479%11	0.9779	701.6	1338.2	754.6	1.7734	65.823	0.000	0.000	42.365
240.0	4.573%11	0.9986	708.3	1402.8	777.8	1.8035	70.397	0.000	0.000	39.489
250.0	4.521%11	0.9871	718.5	1528.8	824.2	1.8548	80.490	0.000	0.000	39.146
260.0	4.299%11	0.9387	725.6	1651.6	870.6	1.8971	91.650	0.000	0.000	38.678
270.0	3.950%11	0.8625	730.5	1772.3	917.0	1.9327	98.000	0.000	0.000	37.567
280.0	3.523%11	0.7692	734.0	1891.5	963.4	1.9633	98.409	0.000	0.000	35.234
290.0	3.065%11	0.6693	736.5	2009.5	1009.9	1.9900	98.416	0.000	0.000	32.072
300.0	2.616%11	0.5713	738.3	2087.9	1056.6	1.9761	98.414	0.000	0.000	28.236
310.0	2.203%11	0.4810	739.6	2127.0	1103.6	1.9273	98.411	1.211	0.103	18.933
320.0	1.838%11	0.4014	740.6	2166.5	1151.6	1.8813	98.408	1.341	0.149	0.897
330.0	1.528%11	0.3317	741.3	2206.0	1201.6	1.8358	98.399	1.402	0.156	0.043
340.0	1.271%11	0.2775	741.9	2245.6	1254.7	1.7898	98.276	1.535	0.171	1.548
350.0	1.060%11	0.2315	742.4	2285.2	1310.7	1.7436	97.221	2.494	0.277	0.567
360.0	8.905%10	0.1944	742.7	2325.0	1368.7	1.6987	95.705	3.863	0.429	0.239
370.0	7.541%10	0.1647	743.0	2364.7	1427.7	1.6563	94.186	5.232	0.581	0.101
380.0	6.450%10	0.1408	743.2	2404.4	1487.0	1.6169	92.673	6.589	0.732	0.001
390.0	5.577%10	0.1275	743.4	2444.2	1546.6	1.5804	91.176	7.941	0.882	0.001
400.0	4.876%10	0.1065	743.5	2483.9	1606.2	1.5465	89.673	9.295	1.033	0.008
410.0	4.212%10	0.0942	743.6	2523.7	1665.8	1.5150	88.158	10.658	1.184	0.000
420.0	3.856%10	0.0842	743.7	2563.4	1725.4	1.4857	86.619	12.043	1.338	0.000
430.0	3.486%10	0.0761	743.8	2603.2	1785.1	1.4583	85.039	13.465	1.496	0.000
440.0	3.183%10	0.0695	743.4	2444.2	1546.6	1.5804	91.176	7.941	0.882	0.000
450.0	2.934%10	0.0641	743.5	2682.7	1904.3	1.4327	83.403	14.937	1.660	0.000
460.0	2.729%10	0.0596	744.0	2722.4	1964.0	1.4087	81.692	16.477	1.831	0.000
470.0	2.559%10	0.0559	744.0	2762.2	2023.6	1.3862	79.895	18.095	2.011	0.000
480.0	2.417%10	0.0446	744.1	2801.9	1785.4	1.4583	78.005	19.795	2.199	0.000
490.0	2.298%10	0.0302	744.1	2841.7	2142.9	1.3450	76.031	21.572	2.397	0.000
500.0	2.198%10	0.0480	744.1	2881.5	2202.5	1.3083	73.986	23.612	2.601	0.000
510.0	2.114%10	0.0462	744.1	2921.2	2262.1	1.2914	71.895	25.295	2.811	0.000
520.0	2.043%10	0.0446	744.2	2961.0	2321.8	1.2753	67.669	27.197	3.022	0.000
530.0	1.981%10	0.0430	744.2	3001.8	2381.6	1.2605	65.000	28.000	3.233	0.000

WE PUT B1# 3.0TD GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH= 3 HOUR= 6.2

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 HAGLA= 40.5 XHI= 90.0
 SUNRISE: 6.2 L.T. SUNSET: 17.9 L.T. SUN DEC. = -3.3
 NMF2= 1.54% HMF1= 0.00% -01 NME= 3.09% 10 NMD= 4.00% 08
 HMF2= 258.1 HMF1= 0.0 HME= 107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDN+	RDN-	RDN*	RDN2+	RDN2-	RDNH+	RDNH-	RDNH*	RDNO+	RDNO-	RDNO*
80.0	2.819%08	0.0018	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.101%08	0.0027	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.812%09	0.0117	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.150%10	0.1641	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.532%10	0.073%10	0.1991	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.073%10	0.1940	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.994%10	0.1612	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	2.487%10	0.1296	290.0	290.0	290.0	1.0000	290.0	290.0	290.0	290.0	290.0	290.0	290.0	290.0	290.0	290.0	290.0
120.0	2.001%10	0.1153	330.8	351.8	330.8	1.0633	330.8	351.8	330.8	351.8	330.8	351.8	330.8	351.8	330.8	351.8	330.8
125.0	1.779%10	0.1153	370.4	412.3	370.4	1.1132	370.4	412.3	370.4	412.3	370.4	412.3	370.4	412.3	370.4	412.3	370.4
130.0	1.846%10	0.1196	469.9	407.1	469.9	1.1544	469.9	407.1	469.9	407.1	469.9	407.1	469.9	407.1	469.9	407.1	469.9
135.0	2.103%10	0.1363	522.9	439.1	522.9	1.1909	522.9	439.1	522.9	439.1	522.9	439.1	522.9	439.1	522.9	439.1	522.9
140.0	2.433%10	0.1576	614.1	468.4	614.1	1.5254	614.1	468.4	614.1	468.4	614.1	468.4	614.1	468.4	614.1	468.4	614.1
145.0	3.232%10	0.2094	689.8	522.2	689.8	1.5254	689.8	522.2	689.8	522.2	689.8	522.2	689.8	522.2	689.8	522.2	689.8
150.0	3.613%10	0.2341	755.5	546.0	755.5	1.5828	755.5	546.0	755.5	546.0	755.5	546.0	755.5	546.0	755.5	546.0	755.5
155.0	4.090%10	0.2650	814.9	563.5	814.9	1.4326	814.9	563.5	814.9	563.5	814.9	563.5	814.9	563.5	814.9	563.5	814.9
160.0	4.736%10	0.3068	870.3	576.9	870.3	1.4717	870.3	576.9	870.3	576.9	870.3	576.9	870.3	576.9	870.3	576.9	870.3
165.0	5.881%10	0.3810	922.7	587.5	922.7	1.5033	922.7	587.5	922.7	587.5	922.7	587.5	922.7	587.5	922.7	587.5	922.7
170.0	6.126%10	0.5265	973.2	596.0	973.2	1.5294	973.2	596.0	973.2	596.0	973.2	596.0	973.2	596.0	973.2	596.0	973.2
175.0	6.677%11	0.6722	1022.0	602.9	1022.0	1.5513	1022.0	602.9	1022.0	602.9	1022.0	602.9	1022.0	602.9	1022.0	602.9	1022.0
180.0	7.236%11	0.8007	1069.6	608.6	1069.6	1.5700	1069.6	608.6	1069.6	608.6	1069.6	608.6	1069.6	608.6	1069.6	608.6	1069.6
185.0	7.388%11	0.8994	1116.3	613.3	1116.3	1.5861	1116.3	613.3	1116.3	613.3	1116.3	613.3	1116.3	613.3	1116.3	613.3	1116.3
190.0	7.881%11	0.9630	1207.0	620.5	1207.0	1.6124	1207.0	620.5	1207.0	620.5	1207.0	620.5	1207.0	620.5	1207.0	620.5	1207.0
195.0	8.125%11	1.0998	1296.0	596.0	1296.0	1.6329	1296.0	596.0	1296.0	596.0	1296.0	596.0	1296.0	596.0	1296.0	596.0	1296.0
200.0	8.126%10	1.05265	1383.3	628.9	1383.3	1.6494	1383.3	628.9	1383.3	628.9	1383.3	628.9	1383.3	628.9	1383.3	628.9	1383.3
205.0	8.127%11	1.06722	1469.6	631.4	1469.6	1.6632	1469.6	631.4	1469.6	631.4	1469.6	631.4	1469.6	631.4	1469.6	631.4	1469.6
210.0	8.137%11	1.09787	1555.1	633.1	1555.1	1.6749	1555.1	633.1	1555.1	633.1	1555.1	633.1	1555.1	633.1	1555.1	633.1	1555.1
215.0	8.236%11	1.09264	1660.4	635.3	1660.4	1.6915	1660.4	635.3	1660.4	635.3	1660.4	635.3	1660.4	635.3	1660.4	635.3	1660.4
220.0	8.430%11	1.0912	1722.3	636.0	1722.3	1.6957	1722.3	636.0	1722.3	636.0	1722.3	636.0	1722.3	636.0	1722.3	636.0	1722.3
225.0	8.314%11	1.0912	1742.2	636.9	1742.2	1.7023	1742.2	636.9	1742.2	636.9	1742.2	636.9	1742.2	636.9	1742.2	636.9	1742.2
230.0	8.177%11	1.0998	1762.1	637.2	1762.1	1.7053	1762.1	637.2	1762.1	637.2	1762.1	637.2	1762.1	637.2	1762.1	637.2	1762.1
235.0	8.543%11	1.09787	1782.1	637.5	1782.1	1.7095	1782.1	637.5	1782.1	637.5	1782.1	637.5	1782.1	637.5	1782.1	637.5	1782.1
240.0	8.511%11	1.09787	1802.1	637.6	1802.1	1.7141	1802.1	637.6	1802.1	637.6	1802.1	637.6	1802.1	637.6	1802.1	637.6	1802.1
245.0	8.333%11	1.0998	1822.1	638.2	1822.1	1.7187	1822.1	638.2	1822.1	638.2	1822.1	638.2	1822.1	638.2	1822.1	638.2	1822.1
250.0	8.232%10	1.0998	1842.1	637.9	1842.1	1.7234	1842.1	637.9	1842.1	637.9	1842.1	637.9	1842.1	637.9	1842.1	637.9	1842.1
255.0	8.284%10	1.0924	1862.1	638.0	1862.1	1.7271	1862.1	638.0	1862.1	638.0	1862.1	638.0	1862.1	638.0	1862.1	638.0	1862.1
260.0	8.667%10	1.0942	1882.1	638.1	1882.1	1.7308	1882.1	638.1	1882.1	638.1	1882.1	638.1	1882.1	638.1	1882.1	638.1	1882.1
265.0	8.923%10	1.0924	1902.1	638.4	1902.1	1.7345	1902.1	638.4	1902.1	638.4	1902.1	638.4	1902.1	638.4	1902.1	638.4	1902.1
270.0	9.236%11	1.0912	1922.1	638.2	1922.1	1.7374	1922.1	638.2	1922.1	638.2	1922.1	638.2	1922.1	638.2	1922.1	638.2	1922.1
275.0	9.681%10	1.0912	1942.1	638.0	1942.1	1.7414	1942.1	638.0	1942.1	638.0	1942.1	638.0	1942.1	638.0	1942.1	638.0	1942.1
280.0	10.670%10	1.0982	1962.1	638.3	1962.1	1.7451	1962.1	638.3	1962.1	638.3	1962.1	638.3	1962.1	638.3	1962.1	638.3	1962.1
285.0	11.186%10	1.09768	1982.1	638.4	1982.1	1.7488	1982.1	638.4	1982.1	638.4	1982.1	638.4	1982.1	638.4	1982.1	638.4	1982.1
290.0	11.534%10	1.0994	2002.1	638.2	2002.1	1.7525	2002.1	638.2	2002.1	638.2	2002.1	638.2	2002.1	638.2	2002.1	638.2	2002.1
295.0	11.422%10	1.0921	2022.1	638.3	2022.1	1.7562	2022.1	638.3	2022.1	638.3	2022.1	638.3	2022.1	638.3	2022.1	638.3	2022.1
300.0	11.327%10	1.09021	2042.1	638.4	2042.1	1.7600	2042.1	638.4	2042.1	638.4	2042.1	638.4	2042.1	638.4	2042.1	638.4	2042.1
305.0	11.131%10	1.0733	2062.1	638.0	2062.1	1.7637	2062.1	638.0	2062.1	638.0	2062.1	638.0	2062.1	638.0	2062.1	638.0	2062.1
310.0	11.085%10	1.0703	2082.1	638.4	2082.1	1.7674	2082.1	638.4	2082.1	638.4	2082.1	638.4	2082.1	638.4	2082.1	638.4	2082.1
315.0	11.046%10	1.0678	2102.1	638.5	2102.1	1.7711	2102.1	638.5	2102.1	638.5	2102.1	638.5	2102.1	638.5	2102.1	638.5	2102.1
320.0	11.025%10	1.0657	2122.1	638.5	2122.1	1.7748	2122.1	638.5	2122.1	638.5	2122.1	638.5	2122.1	638.5	2122.1	638.5	2122.1
325.0	11.013%10	1.0657	2142.1	638.5	2142.1	1.7785	2142.1	638.5	2142.1	638.5	2142.1	638.5	2142.1	638.5	2142.1	638.5	2142.1
330.0	11.000%10	1.0657	2162.1	638.5	2162.1	1.7822	2162.1	638.5	2162.1	638.5	2162.1	638.5	2162.1	638.5	2162.1	638.5	2162.1
335.0	11.000%10	1.0657	2182.1	638.5	2182.1	1.7859	2182.1	638.5	2182.1	638.5	2182.1	638.5	2182.1	638.5	2182.1	638.5	2182.1
340.0	11.000%10	1.0657	2202.1	638.5	2202.1	1.7896	2202.1	638.5	2202.1	638.5	2202.1	638.5	2202.1	638.5	2202.1	638.5	2202.1
345.0	11.000%10	1.0657	2222.1	638.5	2222.1	1.7933	2222.1	638.5	2222.1	638.5	2222.1	638.5	2222.1	638.5	2222.1	638.5	2222.1
350.0	11.000%10	1.0657	2242.1	638.5	2242.1	1.7970	2242.1	638.5	2242.1	638.5	2242.1	638.5	2242.1	638.5	2242.1	638.5	2242.1
355.0	11.000%10	1.0657	2262.1	638.5	2262.1	1.8007	2262.1	638.5	2262.1	638.5	2262.1	638.5	2262.1	638.5	2262.1	638.5	2262.1
360.0	11.000%10	1.0657	2282.1	638.5	2282.1	1.8044	2282.1	638.5	2282.1	638.5	2282.1	638.5	2282.1	638.5	2282.1	638.5	2282.1
365.0	11.000%10	1.0657	2302.1	638.5	2302.1	1.8081	2302.1	638.5	2302.1	638.5	2302.1	638.5	2302.1	638.5	230		

INPUT: LAT= 44.1 LONGI= 2.0 R= 10 MONTH= 3 H1UR= 0.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DTP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 139.2
 SUNRSE: 6.2 L.T. SUNSET:17.8 L.T. SUN DEC. = -3.3
 NMF2=1.26%11 HMF1= 0.00%-01 NMF1=1.78%09 NMF2=4.00%08
 HMF2=349.1 HMF1= 0.0 HME=105.0 HMD= 88.0

H	NE	N/HMAX	TN	TE	TI	TE/TI	RDO+	RDH+	RDHE+	RDO2+	RDH2+	RDHE2+	RDN0+
80.0	5.385%05	4.3%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.473%08	0.002C	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.725%08	0.0037	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0138	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0141	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.775%09	0.0141	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.451%09	0.0115	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	9.452%08	0.0075	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	6.014%08	0.0048	287.3	287.3	287.3	287.3	287.3	287.3	287.3	287.3	287.3	287.3	287.3
125.0	4.233%08	0.0034	327.2	338.1	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2	327.2
130.0	3.503%08	0.0028	365.7	387.1	365.7	365.7	365.7	365.7	365.7	365.7	365.7	365.7	365.7
135.0	3.445%08	0.0027	401.4	434.4	401.4	401.4	401.4	401.4	401.4	401.4	401.4	401.4	401.4
140.0	3.927%08	0.0031	432.4	476.3	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4	432.4
150.0	6.544%08	0.0052	479.7	545.6	479.7	479.7	479.7	479.7	479.7	479.7	479.7	479.7	479.7
160.0	1.103%09	0.0087	511.9	599.8	511.9	511.9	511.9	511.9	511.9	511.9	511.9	511.9	511.9
170.0	1.765%09	0.0140	534.5	644.3	534.5	534.5	534.5	534.5	534.5	534.5	534.5	534.5	534.5
180.0	2.227%09	0.0177	551.0	682.9	551.0	551.0	551.0	551.0	551.0	551.0	551.0	551.0	551.0
190.0	2.747%09	0.0218	563.7	717.5	563.7	563.7	563.7	563.7	563.7	563.7	563.7	563.7	563.7
200.0	3.412%09	0.0270	573.6	749.4	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6	573.6
210.0	4.277%09	0.0339	581.6	779.4	581.6	581.6	581.6	581.6	581.6	581.6	581.6	581.6	581.6
220.0	5.428%09	0.0430	588.1	807.9	588.1	588.1	588.1	588.1	588.1	588.1	588.1	588.1	588.1
230.0	7.009%09	0.0555	593.5	835.2	593.5	593.5	593.5	593.5	593.5	593.5	593.5	593.5	593.5
240.0	9.300%09	0.0737	597.9	861.6	597.9	597.9	597.9	597.9	597.9	597.9	597.9	597.9	597.9
250.0	2.092%10	0.1658	604.7	912.3	604.7	604.7	604.7	604.7	604.7	604.7	604.7	604.7	604.7
260.0	1.254%11	0.9940	609.3	960.9	609.3	609.3	609.3	609.3	609.3	609.3	609.3	609.3	609.3
270.0	1.204%11	0.9542	618.5	1189.8	618.5	618.5	618.5	618.5	618.5	618.5	618.5	618.5	618.5
280.0	1.116%11	0.8847	619.2	1234.4	619.2	619.2	619.2	619.2	619.2	619.2	619.2	619.2	619.2
290.0	1.005%11	0.7965	619.7	1234.5	619.7	619.7	619.7	619.7	619.7	619.7	619.7	619.7	619.7
300.0	1.134%11	0.9925	616.5	1099.9	616.5	616.5	616.5	616.5	616.5	616.5	616.5	616.5	616.5
310.0	1.252%11	0.9940	617.7	1145.0	617.7	617.7	617.7	617.7	617.7	617.7	617.7	617.7	617.7
320.0	1.204%11	0.9542	620.3	1234.7	620.3	620.3	620.3	620.3	620.3	620.3	620.3	620.3	620.3
330.0	1.116%11	0.8847	621.4	1234.8	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
340.0	1.005%11	0.7965	620.9	1234.9	620.9	620.9	620.9	620.9	620.9	620.9	620.9	620.9	620.9
350.0	1.047%10	0.7005	620.1	1234.6	620.1	620.1	620.1	620.1	620.1	620.1	620.1	620.1	620.1
360.0	7.644%10	0.6058	621.0	1234.7	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0
370.0	1.204%11	0.9542	621.5	1235.1	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
380.0	1.116%11	0.8847	621.4	1235.2	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
390.0	1.005%11	0.7965	621.0	1235.4	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0
400.0	8.839%10	0.7005	621.5	1235.7	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
410.0	7.644%10	0.6058	621.3	1235.4	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3
420.0	1.204%11	0.9542	621.8	1235.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8
430.0	1.116%11	0.8847	621.7	1234.9	621.7	621.7	621.7	621.7	621.7	621.7	621.7	621.7	621.7
440.0	1.005%11	0.7965	621.2	1235.4	621.2	621.2	621.2	621.2	621.2	621.2	621.2	621.2	621.2
450.0	8.839%10	0.7005	621.3	1235.5	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3
460.0	7.644%10	0.6058	621.4	1235.6	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
470.0	1.204%11	0.9542	621.8	1235.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8	621.8
480.0	1.116%11	0.8847	621.7	1234.7	621.7	621.7	621.7	621.7	621.7	621.7	621.7	621.7	621.7
490.0	5.566%10	0.4412	621.0	1235.2	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0	621.0
500.0	4.737%10	0.2101	621.4	1235.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
510.0	2.352%10	0.1864	621.3	1235.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3
520.0	2.110%10	0.1673	621.3	1235.4	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3	621.3
530.0	1.915%10	0.1518	621.5	1235.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
540.0	1.757%10	0.1392	621.4	1235.6	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
550.0	1.628%10	0.1290	621.4	1235.7	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4	621.4
560.0	1.522%10	0.1207	621.5	1235.7	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
570.0	1.436%10	0.1138	621.5	1235.8	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
580.0	1.365%10	0.1082	621.5	1235.9	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
590.0	1.306%10	0.1035	621.5	1235.9	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5
600.0	1.257%10	0.0996	621.5	1236.0	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5	621.5

WE PUT B1= 3. OTU GET HIST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH= 6 HNUR=12.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 HAGLA= 40.5 XHI= 21.0
 SUNRISE: 4.4 L.T. SUNSET: 19.6 L.T. SUN DEC.= 23.1
 NMF1=3.53%11 HMF1= 2.44%11 HME=1.33%11 NMD=6.14%08
 HMF2=231.3 HNF1=179.0 HME=110.0 HMD= 81.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDHE+	RDN0+	RDHE+	RDN0+
80.0	5.884%08	0.0017	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.235%09	0.0035	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.274%10	0.0361	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	5.144%11	0.1459	-1	-1	-1	-1	0.235	0.000	0.000	48.255	51.510
100.0	1.019%11	0.2891	-1	-1	-1	-1	0.338	0.000	0.000	44.770	54.892
105.0	1.290%11	0.3659	-1	-1	-1	-1	0.488	0.000	0.000	41.644	57.869
110.0	1.330%11	0.3771	-1	-1	-1	-1	0.702	0.000	0.000	38.967	60.331
115.0	1.295%11	0.3674	-1	-1	-1	-1	1.007	0.000	0.000	36.868	62.125
120.0	1.270%11	0.3602	308.2	308.2	308.2	1.0000	1.439	0.000	0.000	35.393	63.168
125.0	1.318%11	0.3739	356.0	356.0	356.0	1.0800	2.041	0.000	0.000	34.401	63.558
130.0	1.380%11	0.3915	402.5	459.5	402.5	1.1415	2.861	0.000	0.000	33.677	63.462
135.0	1.437%11	0.4075	446.4	531.9	446.4	1.1914	3.937	0.000	0.000	33.077	62.985
140.0	1.501%11	0.4256	485.9	599.8	485.9	1.2345	6.838	0.000	0.000	32.008	61.154
145.0	1.658%11	0.4703	549.8	720.7	549.8	1.3109	10.219	0.000	0.000	31.000	58.781
150.0	1.894%11	0.5371	824.1	596.2	824.1	1.3822	13.432	0.000	0.000	30.011	56.557
155.0	2.253%11	0.6391	630.3	915.1	630.3	1.4519	16.472	0.000	0.000	28.938	54.590
160.0	2.478%11	0.7028	656.0	997.8	656.0	1.5211	19.642	0.000	0.000	27.168	53.190
165.0	2.870%11	0.8138	676.0	1074.8	676.0	1.5840	23.190	0.000	0.000	22.751	54.059
170.0	3.174%11	0.9002	692.0	1147.8	701.1	1.6371	27.286	0.000	0.000	16.094	56.620
175.0	3.379%11	0.9584	704.9	1217.7	723.6	1.6828	32.070	0.000	0.000	10.613	57.317
180.0	3.490%11	0.9899	715.6	1285.3	746.2	1.7225	37.679	0.000	0.000	6.909	55.411
185.0	3.526%11	0.9999	724.3	1351.0	768.7	1.7575	44.264	0.000	0.000	4.490	51.246
190.0	3.513%11	0.9963	731.6	1415.3	791.2	1.7887	61.068	0.000	0.000	1.895	37.037
195.0	3.392%11	0.9621	742.7	1540.3	836.3	1.8417	83.427	0.000	0.000	0.800	15.773
200.0	3.165%14	0.8977	750.3	1661.9	881.4	1.8855	98.000	0.000	0.000	0.338	1.662
205.0	3.865%11	0.8126	755.7	1781.2	926.5	1.9225	98.986	0.000	0.000	0.142	0.872
210.0	2.528%11	0.7170	759.5	1898.9	971.6	1.9544	98.986	0.000	0.000	4.490	0.936
215.0	2.185%11	0.6197	762.2	2015.5	1016.8	1.9822	99.004	0.000	0.000	0.060	0.013
220.0	1.859%11	0.5273	764.1	2092.8	1062.2	1.9703	99.003	0.511	0.057	0.025	0.404
225.0	1.565%11	0.4440	765.6	2131.9	1108.0	1.9241	99.000	0.737	0.082	0.011	0.171
230.0	1.310%11	0.3716	766.6	2171.4	1154.9	1.8802	98.996	0.834	0.093	0.005	0.072
235.0	1.095%14	0.3104	767.4	2211.0	1204.0	1.8364	98.988	0.000	0.000	0.002	0.030
240.0	9.161%10	0.2598	768.1	2250.8	1256.5	1.7913	98.864	1.010	0.112	0.001	0.013
245.0	4.190%10	0.2185	768.5	2290.7	1312.4	1.7454	97.803	1.972	0.219	0.000	0.005
250.0	6.523%10	0.1850	768.9	2330.6	1370.5	1.7005	96.278	3.348	0.372	0.000	0.002
255.0	5.572%10	0.1580	769.2	2370.6	1429.7	1.6580	94.749	4.725	0.525	0.000	0.001
260.0	4.806%10	0.1363	769.4	2410.5	1489.4	1.6184	93.232	6.090	0.677	0.000	0.000
265.0	4.269%10	0.0763	770.1	2450.5	1549.3	1.5817	91.722	7.450	0.828	0.000	0.000
270.0	1.905%10	0.1188	769.6	2490.4	1609.2	1.5477	90.209	8.612	0.979	0.000	0.000
275.0	3.692%10	0.1047	769.8	2530.4	1669.1	1.5160	88.686	10.183	1.131	0.000	0.000
280.0	3.288%10	0.0933	769.9	2570.3	1729.0	1.4866	87.137	11.577	1.286	0.000	0.000
285.0	2.137%10	0.0606	770.0	2610.3	1789.4	1.4591	85.548	13.007	1.445	0.000	0.000
290.0	2.960%10	0.0570	770.1	2650.3	1848.9	1.4334	83.902	14.488	1.610	0.000	0.000
295.0	2.692%10	0.0540	770.4	2690.2	1908.8	1.4093	82.181	16.037	1.782	0.000	0.000
300.0	2.471%10	0.0515	770.2	2730.2	1968.8	1.3867	80.373	17.665	1.963	0.000	0.000
305.0	2.289%10	0.0649	770.3	2770.1	2028.7	1.3655	78.472	19.375	2.153	0.000	0.000
310.0	2.137%10	0.0494	770.5	2810.1	2088.7	1.3454	76.485	21.163	2.351	0.000	0.000
315.0	2.011%10	0.0570	770.4	2850.1	2148.6	1.3265	74.429	23.014	2.557	0.000	0.000
320.0	1.905%10	0.0540	770.2	2890.0	2208.5	1.3086	72.325	24.908	2.768	0.000	0.000
325.0	1.817%10	0.0515	770.4	2930.0	2268.5	1.2916	70.199	26.821	2.980	0.000	0.000
330.0	1.741%10	0.0494	770.5	2930.0	2238.4	1.2755	68.074	28.734	3.193	0.000	0.000
335.0	1.624%10	0.0461	770.5	2969.9							WE PUT B1= 3.070 GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH= 6 HOUR= 4.4

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CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 90.0
SUNRISE= 4.4 L.T. SUNSET= 19.6 L.T. SUN DEC.= 23.1
NMF2=1.71211 NMF1= 0.00%01 NME=2.97%10 NMD=4.00%08
HMF2=292.4 HMF1= 0.0 HME=107.5 HMD= 84.5

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		TE	T1	T2	TE/T1
N/NMAX	NE	-1	-1	-1	-1
H	0.0	2.819%08	0.00017	0.00017	-1
	5.0	4.101%08	0.0024	0.0024	-1
	0.0	1.811%09	0.0106	0.0106	-1
	5.0	1.134%10	0.0665	0.0665	-1
	0.0	2.457%10	0.1440	0.1440	-1
	5.0	2.957%10	0.1734	0.1734	-1
	0.0	2.880%10	0.1689	0.1689	-1
	5.0	2.395%10	0.1404	0.1404	-1
	0.0	1.926%10	0.1129	0.1129	-1
	5.0	1.712%10	0.1003	0.1003	-1
	0.0	1.777%10	0.1042	0.1042	-1
	5.0	3.081%10	0.1806	0.1806	-1
	0.0	3.144%10	0.1943	0.1943	-1
	5.0	3.582%10	0.2100	0.2100	-1
	0.0	3.894%10	0.2283	0.2283	-1
	0.0	2.356%10	0.1381	0.1381	-1
	0.0	4.020%10	0.2504	0.2504	-1
	0.0	4.756%10	0.2788	0.2788	-1
	0.0	5.475%10	0.3209	0.3209	-1
	0.0	7.235%10	0.4241	0.4241	-1
	0.0	9.496%10	0.5567	0.5567	-1
	0.0	1.711%11	0.6863	0.6863	-1
	0.0	1.520%11	0.8910	0.8910	-1
	0.0	1.685%11	0.9875	0.9875	-1
	0.0	1.701%11	0.9972	0.9972	-1
	0.0	1.644%11	0.9648	0.9648	-1
	0.0	1.539%11	0.9020	0.9020	-1
	0.0	1.396%11	0.8186	0.8186	-1
	0.0	1.237%11	0.7249	0.7249	-1
	0.0	1.074%11	0.6297	0.6297	-1
	0.0	9.206%10	0.5397	0.5397	-1
	0.0	7.824%10	0.4586	0.4586	-1
	0.0	6.525%10	0.3884	0.3884	-1
	0.0	5.614%10	0.3291	0.3291	-1
	0.0	4.775%10	0.2799	0.2799	-1
	0.0	4.069%10	0.2397	0.2397	-1
	0.0	3.531%10	0.2070	0.2070	-1
	0.0	3.080%10	0.1805	0.1805	-1
	0.0	2.715%10	0.1591	0.1591	-1
	0.0	2.419%10	0.1418	0.1418	-1
	0.0	2.178%10	0.1277	0.1277	-1
	0.0	1.983%10	0.1162	0.1162	-1
	0.0	1.822%10	0.1068	0.1068	-1
	0.0	1.691%10	0.0991	0.0991	-1
	0.0	1.582%10	0.0927	0.0927	-1
	0.0	1.492%10	0.0874	0.0874	-1
	0.0	1.417%10	0.0831	0.0831	-1
	0.0	1.354%10	0.0794	0.0794	-1
	0.0	1.302%10	0.0763	0.0763	-1
	0.0	1.257%10	0.0737	0.0737	-1
	PUT	3.070	GET	HST	

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MDIP= 50.8 HAGLA= 40.5 XHI= 112.8
 SUNRISE: 4.4 L.T. SUNSET: 19.6 L.T. SUN DEC.= 23.1
 NMF2=2.40% 11 NMFI= 0.00% -01 NME=1.78% 09 NMD=4.00% 08
 HMF2=315.2 HMFI= 0.0 HME=105.1 HMD= 87.9

	NE	TN	TE	TI	TE/TI	RDO+	RDHE+	RDH+	RDNO+
H	80.0 9.273% 05	3.9%-6	-1	-1	-1	-1	-1	-1	-1
85.0 2.589% 08	0.0011	-1	-1	-1	-1	-1	-1	-1	-1
90.0 4.783% 08	0.0020	-1	-1	-1	-1	-1	-1	-1	-1
95.0 1.746% 09	0.0073	-1	-1	-1	-1	0.001	0.000	0.000	5.910 94.089
100.0 1.775% 09	0.0074	-1	-1	-1	-1	0.002	0.000	0.000	7.936 92.062
105.0 1.775% 09	0.0074	-1	-1	-1	-1	0.004	0.000	0.000	10.632 89.363
110.0 1.460% 09	0.0061	-1	-1	-1	-1	0.008	0.000	0.000	14.159 85.832
115.0 9.585% 08	0.0040	-1	-1	-1	-1	0.016	0.000	0.000	18.573 81.411
120.0 6.151% 08	0.0026	292.3	292.3	1.0000	0.000	0.000	0.000	0.000	23.546 76.424
125.0 4.366% 08	0.0018	334.0	344.6	1.0317	0.031	0.000	0.000	0.000	28.079 71.862
130.0 3.638% 08	0.0015	374.4	395.6	1.0566	0.059	0.000	0.000	0.000	31.037 68.851
135.0 3.595% 08	0.0017	412.0	443.8	1.0772	0.111	0.000	0.000	0.000	32.272 67.518
140.0 4.107% 08	0.0015	412.0	444.9	1.0953	0.210	0.000	0.000	0.000	32.100 67.195
145.0 6.802% 08	0.0028	444.9	487.3	1.1282	0.705	0.000	0.000	0.000	31.000 66.958
150.0 6.802% 08	0.0028	495.9	559.5	1.1596	2.042	0.000	0.000	0.000	29.785 65.644
160.0 1.132% 09	0.0047	531.2	531.2	1.1596	4.570	0.000	0.000	0.000	28.432 63.835
170.0 1.975% 09	0.0082	556.1	662.0	1.1905	7.732	0.000	0.000	0.000	26.086 63.018
180.0 3.820% 09	0.0159	574.5	701.6	1.2195	10.895	0.000	0.000	0.000	20.207 65.656
190.0 7.202% 09	0.0301	588.6	736.9	1.2404	14.137	0.000	0.000	0.000	12.192 70.018
200.0 1.322% 10	0.0552	599.7	769.3	1.2551	17.790	0.000	0.000	0.000	6.630 71.218
210.0 2.360% 10	0.0985	615.9	631.7	1.2656	22.152	0.000	0.000	0.000	5.537 68.976
220.0 4.035% 10	0.1684	616.0	827.9	1.2729	27.487	0.000	0.000	0.000	1.882 64.051
230.0 6.332% 10	0.2643	622.1	855.2	1.2778	34.066	0.000	0.000	0.000	0.533 47.201
240.0 9.160% 10	0.3824	627.0	881.3	1.2810	52.267	0.000	0.000	0.000	0.151 20.720
260.0 1.549% 11	0.6465	634.6	931.3	1.2836	79.130	0.000	0.000	0.000	1.957 0.000
280.0 2.075% 11	0.8664	639.9	978.9	1.2828	98.000	0.000	0.000	0.000	0.043 0.000
300.0 2.347% 11	0.9800	643.5	1024.9	1.2802	98.531	1.316	0.146	0.000	0.012 0.703
320.0 2.392% 11	0.9988	646.1	1069.9	1.2766	99.285	0.000	0.000	0.000	1.884 0.000
340.0 2.322% 11	0.9695	647.9	1114.1	1.2728	99.266	0.405	0.045	0.003	0.000 0.260
360.0 2.172% 11	0.9068	649.3	1157.8	1.2693	99.201	0.647	0.072	0.001	0.000 0.079
380.0 1.967% 11	0.8213	650.2	1201.2	1.2671	99.095	0.794	0.088	0.000	0.000 0.022
400.0 1.735% 11	0.7244	651.0	1244.3	1.2684	98.531	1.239	0.146	0.000	0.000 0.006
420.0 1.499% 11	0.6260	651.5	1244.8	1.2343	95.154	4.360	0.484	0.000	0.000 0.002
440.0 1.277% 11	0.5332	651.9	1245.3	1.2077	90.703	8.367	0.930	0.000	0.000 0.001
460.0 1.079% 11	0.4503	652.3	1245.8	1.0384	1.1997	86.302	1.370	0.000	0.000 0.000
480.0 9.080% 10	0.3791	652.5	1246.3	1.0437	1.1941	81.951	1.805	0.000	0.000 0.000
500.0 7.652% 10	0.3195	652.7	1246.8	1.0463	1.1917	77.609	2.152	0.000	0.000 0.000
520.0 6.480% 10	0.2705	652.9	1247.3	1.0477	1.1905	73.235	2.676	0.000	0.000 0.000
540.0 5.529% 10	0.2308	653.0	1247.8	1.0487	1.1898	68.801	2.679	3.120	0.000 0.000
560.0 4.763% 10	0.1988	653.1	1248.3	1.0496	1.1894	64.296	3.134	3.570	0.000 0.000
580.0 4.148% 10	0.1731	653.2	1248.8	1.0503	1.1889	59.738	3.235	4.026	0.000 0.000
600.0 3.653% 10	0.1525	653.3	1249.3	1.0511	1.1886	55.177	4.340	4.482	0.000 0.000
620.0 3.255% 10	0.1359	653.3	1249.8	1.0519	1.1882	50.681	4.4387	4.932	0.000 0.000
640.0 2.934% 10	0.1225	653.4	1250.3	1.0526	1.1878	46.325	4.8308	5.368	0.000 0.000
660.0 2.674% 10	0.1116	653.4	1250.8	1.0534	1.1874	42.173	52.044	5.783	0.000 0.000
680.0 2.462% 10	0.1028	653.5	1251.3	1.0541	1.1886	38.274	55.553	6.173	0.000 0.000
700.0 2.289% 10	0.0955	653.5	1251.8	1.0549	1.1867	34.655	58.811	6.535	0.000 0.000
720.0 2.146% 10	0.0896	653.5	1252.3	1.0556	1.1863	31.325	61.808	6.868	0.000 0.000
740.0 2.029% 10	0.0847	653.5	1252.8	1.0563	1.1860	28.281	64.567	7.172	0.000 0.000
760.0 1.931% 10	0.0806	653.6	1253.3	1.0571	1.1856	25.512	67.039	7.449	0.000 0.000
780.0 1.850% 10	0.0772	653.6	1253.8	1.0578	1.1852	23.001	69.299	7.700	0.000 0.000
800.0 1.783% 10	0.0744	653.6	1254.3	1.0586	1.1849	20.729	71.344	7.927	0.000 0.000

WE PUT 81# 3.070 GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTTH=12 HOUR=12:0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 67.0
 SUNRISE: 7:6 L.T. SUNSET: 16:4 L.T. SUN DEC.= -22.
 NMFF2=4.1%11 HMF1= 0.00%-01 NME=8.75%10 NMD=4.00%08
 NMFF2=215.6 HMF1= 0.0 HME=109.9 HMD= 81.2

INIT: ATI=44.1 LONG=2.0 R=10 MONTH=12 HOUR=7.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 90.0
 SUNRISE= 7.6 L.T. SUNSET= 16.4 L.T. SUN DEC= -22.9
 NMFD2= 2.03% NMFI= 0.00% -01 NMD= 4.00% 08
 NMFD2= 2.25% NMFI= 0.00% HMD= 107.5 HME= 84.5

800.01.084%10 0.0234
WE PUT 81% 3.070 GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R= 10 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 158.8
 SUNRISE: 7.6 L.T. SUNSET: 16.4 L.T. SUN DEC.= -22.9
 NMF1= 1.07% NMF2= 1.07% NMF1= 0.00% NMF2= 1.78% NMF1= 0.00% NMF2= 4.00% NMF1= 8.0 HMD= 88.0

H	NE	N/NMAX	TN	TE	TE/TI	RDD+	RDHE+	RDH+	RD02+	RDNO+
80.0	4.960%05	4.7%-6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.455%08	0.0023	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.721%08	0.0044	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.742%09	0.0163	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0166	-1	-1	-1	0.003	0.000	0.000	17.568	82.429
105.0	1.775%09	0.0166	-1	-1	-1	0.006	0.000	0.000	20.399	79.595
110.0	1.449%09	0.0136	-1	-1	-1	0.012	0.000	0.000	23.675	76.313
115.0	9.433%08	0.0088	-1	-1	-1	0.023	0.000	0.000	27.442	72.535
120.0	5.994%08	0.0056	285.3	285.3	1.0000	0.044	0.000	0.000	31.698	68.258
125.0	4.214%08	0.0040	324.3	335.5	1.0345	0.084	0.000	0.000	36.294	63.621
130.0	3.483%08	0.0033	362.1	384.5	1.0618	0.161	0.000	0.000	40.716	59.123
135.0	3.423%08	0.0032	397.0	430.0	1.0846	0.307	0.000	0.000	43.939	55.754
140.0	3.901%08	0.0037	427.1	471.9	1.1048	0.584	0.000	0.000	45.000	54.416
145.0	6.507%08	0.0061	473.0	540.1	1.1420	2.075	0.000	0.000	41.880	56.044
150.0	1.099%09	0.0103	504.0	593.5	1.1776	6.912	0.000	0.000	36.631	56.457
155.0	1.758%09	0.0165	525.6	637.5	1.2124	19.672	0.000	0.000	30.703	49.625
160.0	2.218%09	0.0208	541.4	675.7	1.2382	41.907	0.000	0.000	21.641	36.451
165.0	2.797%09	0.0262	553.5	710.2	1.2556	63.821	0.000	0.000	10.559	25.620
170.0	3.561%09	0.0334	563.0	742.0	1.2674	77.006	0.000	0.000	4.137	18.857
175.0	4.591%09	0.0431	570.6	772.0	1.2753	83.329	0.000	0.000	1.545	15.125
180.0	6.028%09	0.0565	576.8	800.6	1.2805	86.537	0.000	0.000	0.573	12.890
185.0	8.143%09	0.0764	581.9	828.1	1.2837	88.599	0.000	0.000	0.212	11.188
190.0	1.162%10	0.1090	586.2	854.7	1.2853	90.280	0.000	0.000	0.079	9.641
195.0	2.187%10	0.2989	592.6	905.9	1.2854	93.390	0.000	0.000	0.011	6.599
200.0	6.376%10	0.5979	597.0	955.1	1.2945	96.417	0.000	0.000	0.001	3.582
205.0	9.190%10	0.8618	600.1	1002.9	1.2788	98.000	0.000	0.000	0.000	2.000
210.0	1.052%11	0.9869	602.3	1049.9	1.2742	98.071	0.000	0.000	0.000	1.231
215.0	1.062%11	0.9959	603.8	1096.2	1.2696	98.030	0.000	0.000	0.000	0.169
220.0	1.024%11	0.9607	604.9	1142.1	1.2655	97.995	1.810	0.201	0.000	0.023
225.0	9.552%10	0.8958	605.8	1187.7	1.2631	97.860	1.923	0.214	0.000	0.003
230.0	8.652%10	0.8114	606.4	1233.0	1.2644	97.304	2.4426	0.270	0.000	0.000
235.0	1.052%11	0.9869	602.3	1049.9	1.2742	98.071	0.000	0.000	0.000	1.231
240.0	1.062%11	0.9959	603.8	1096.2	1.2696	98.030	0.000	0.000	0.000	0.169
245.0	6.656%10	0.6242	607.2	1233.1	1.2042	89.573	1.384	1.043	0.000	0.000
250.0	3.561%10	0.5364	607.5	1233.1	1.034.8	85.227	13.296	1.477	0.000	0.000
255.0	5.720%10	0.4581	607.7	1233.1	1.039.7	1.1860	80.930	17.163	1.907	0.000
260.0	4.885%10	0.4150	607.9	1233.1	1.041.7	1.1837	76.642	21.022	2.326	0.000
265.0	4.165%10	0.3906	607.9	1233.0	1.042.5	1.1829	72.323	24.909	0.603	0.000
270.0	3.561%10	0.3339	608.0	1233.1	1.043.1	1.1825	67.944	2.768	0.000	0.000
275.0	3.061%10	0.2871	608.1	1233.2	1.042.9	1.1824	63.494	28.851	3.206	0.000
280.0	2.653%10	0.2488	608.2	1233.2	1.043.8	1.1823	45.748	32.855	3.651	0.000
285.0	2.322%10	0.2177	608.3	1233.2	1.043.0	1.1824	58.994	36.905	4.101	0.000
290.0	2.053%10	0.1925	608.3	1233.1	1.043.1	1.1823	54.490	40.955	4.551	0.000
295.0	1.835%10	0.1721	608.4	1233.2	1.043.1	1.1823	50.050	44.955	4.995	0.000
300.0	1.656%10	0.1555	608.4	1233.3	1.043.1	1.1823	30.934	62.159	6.907	0.000
305.0	1.515%10	0.1421	608.5	1233.3	1.043.1	1.1823	41.648	52.517	5.835	0.000
310.0	1.398%10	0.1311	608.5	1233.3	1.043.2	1.1823	37.797	55.982	6.220	0.000
315.0	1.302%10	0.1220	608.5	1233.3	1.043.2	1.1822	34.223	59.199	6.578	0.000
320.0	1.222%10	0.1146	608.5	1233.3	1.043.2	1.1822	30.934	62.159	6.907	0.000
325.0	1.157%10	0.1085	608.6	1233.4	1.043.3	1.1822	27.929	64.864	7.407	0.000
330.0	1.103%10	0.1034	608.6	1233.4	1.043.3	1.1822	25.194	67.325	7.481	0.000
335.0	1.058%10	0.0992	608.6	1233.4	1.043.4	1.1822	22.714	69.557	7.729	0.000
340.0	1.020%10	0.0957	608.6	1233.4	1.043.4	1.1822	20.471	71.576	7.953	0.000

WE PUP B1= 4.0TU GET HST

INPUT: LATI= 44.1 LONGI= -2.0 R=100 MONTH= 3 HUR=12.0

CALCULATED VALUES: MLAT= 46.6 MAGLA= 40.5 XHI= 47.4
 DTP= 59.6 MODIP= 50.8 SUNSET:17.8 L.T. SUN DEC.= -3.3
 SUNRISE: 6.2 L.T. NME=1.47%11 NMD=1.11%09
 NMF2=1.31%12 NMFL1= 3.06% 11 NMFL2=1.47%11 NMD=1.11%09
 NMF2=285.6 NMFL1=182.4 HME=110.0 HMD= 81.0

H	IE	TN	TE	TI	TE/TI	RDD*	RDH*	RDHE*	RDQ2*	RDNO*
80.0	1.060%09	8.1%4	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.204%09	0.0017	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.128%10	0.0162	-1	-1	-1	-1	-1	-1	-1	-1
95.0	7.314%10	0.0557	-1	-1	-1	-1	-1	-1	-1	46.137
100.0	1.246%11	0.0949	-1	-1	-1	-1	-1	-1	-1	53.540
105.0	1.450%11	0.1105	-1	-1	-1	-1	-1	-1	-1	46.031
110.0	1.471%11	0.1120	-1	-1	-1	-1	-1	-1	-1	47.889
115.0	1.426%11	0.1086	-1	-1	-1	-1	-1	-1	-1	48.766
120.0	1.399%11	0.1066	336.0	336.0	1.0000	0.000	0.000	0.000	0.000	49.792
125.0	1.449%11	0.1104	394.4	417.1	394.4	1.0576	0.000	0.000	0.000	51.118
130.0	1.479%11	0.1126	451.4	496.8	451.4	1.1007	3.844	0.000	0.000	52.663
135.0	1.495%11	0.1139	506.4	574.6	506.4	1.1346	5.771	0.000	0.000	53.958
140.0	1.520%11	0.1158	557.9	648.8	557.9	1.1629	8.609	0.000	0.000	54.391
145.0	1.609%11	0.1175	647.4	783.7	647.4	1.2106	18.448	0.000	0.000	50.606
150.0	1.805%11	0.1375	900.5	978.7	900.5	1.2529	35.534	0.000	0.000	38.858
155.0	2.336%11	0.1779	718.8	718.8	718.8	1.2529	3.844	0.000	0.000	43.493
160.0	3.117%11	0.2375	775.1	1002.3	775.1	1.2931	56.597	0.000	0.000	20.356
165.0	4.311%11	0.3284	819.9	1092.5	819.9	1.3325	72.988	0.000	0.000	12.009
170.0	6.002%11	0.4573	856.1	1174.2	856.1	1.3715	81.759	0.000	0.000	15.002
175.0	7.694%11	0.5861	885.7	1249.3	885.7	1.4104	85.877	0.000	0.000	12.009
180.0	9.230%11	0.7031	930.6	1385.0	930.6	1.4493	88.060	0.000	0.000	7.616
185.0	1.051%12	0.8006	947.5	1447.3	947.5	1.4883	89.554	0.000	0.000	2.577
190.0	1.150%12	0.8760	961.6	1506.9	961.6	1.5275	90.823	0.000	0.000	1.817
195.0	1.269%12	0.9665	983.3	1619.4	983.3	1.5669	92.025	0.000	0.000	1.808
200.0	1.311%12	0.9985	998.3	1725.4	998.3	1.6057	94.409	0.000	0.000	4.701
205.0	1.302%12	0.9916	1008.9	1826.8	1008.9	1.6378	96.763	0.000	0.000	5.237
210.0	1.302%12	1016.4	1925.2	1016.4	1015.8	1.6985	98.000	0.000	0.000	6.772
215.0	1.253%12	0.9545	1021.7	2021.4	1021.7	1.7517	98.077	0.000	0.000	6.600
220.0	1.172%12	0.8929	1021.7	2088.1	1021.7	1.7992	98.077	0.000	0.000	1.817
225.0	1.069%12	0.8145	1025.5	2028.4	1025.5	1.8440	98.073	0.000	0.000	1.784
230.0	9.547%11	0.7273	1028.4	2127.1	1028.4	1.8840	98.069	0.000	0.000	0.157
235.0	8.381%11	0.6384	1030.5	2166.5	1030.5	1.8840	98.069	0.000	0.000	0.003
240.0	7.262%11	0.5532	1032.1	2206.0	1032.1	1.8075	98.061	0.000	0.000	0.052
245.0	6.239%11	0.4753	1033.3	2245.6	1033.3	1.8422	98.077	0.000	0.000	1.321
250.0	5.334%11	0.4063	1034.2	2088.1	1034.2	1.8563	98.075	0.000	0.000	0.026
255.0	4.554%11	0.3469	1035.0	2325.0	1035.0	1.8840	98.073	0.000	0.000	0.320
260.0	3.893%11	0.2966	1035.6	2364.7	1035.6	1.9200	98.073	0.000	0.000	0.013
265.0	3.342%11	0.2544	1036.0	2404.4	1036.0	1.9487	98.073	0.000	0.000	0.438
270.0	2.885%11	0.2198	1036.4	2444.2	1036.4	1.9784	98.073	0.000	0.000	2.784
275.0	2.509%11	0.1911	1036.7	2483.9	1036.7	2.0000	98.073	0.000	0.000	0.461
280.0	2.199%11	0.1675	1037.0	2523.7	1037.0	2.0350	98.073	0.000	0.000	0.005
285.0	1.945%11	0.1482	1037.2	2563.4	1037.2	2.0754	98.073	0.000	0.000	0.002
290.0	1.736%11	0.1322	1037.3	2603.4	1037.3	2.1167	98.073	0.000	0.000	0.001
295.0	1.563%11	0.1191	1037.5	2642.9	1037.5	2.1583	98.073	0.000	0.000	0.001
300.0	1.421%11	0.1082	1037.6	2682.7	1037.6	2.1904	98.073	0.000	0.000	0.001
305.0	1.302%11	0.0992	1037.7	2722.4	1037.7	2.2226	98.073	0.000	0.000	0.000
310.0	1.203%11	0.0917	1037.8	2762.2	1037.8	2.2550	98.073	0.000	0.000	0.000
315.0	1.120%11	0.0853	1037.9	2801.9	1037.9	2.2873	98.073	0.000	0.000	0.000
320.0	1.051%11	0.0800	1038.0	2841.7	1038.0	2.3261	98.073	0.000	0.000	0.000
325.0	9.921%10	0.0756	1038.0	2881.5	1038.0	2.3625	98.073	0.000	0.000	0.000
330.0	9.424%10	0.0718	1038.1	2921.2	1038.1	2.4046	98.073	0.000	0.000	0.000
335.0	9.001%10	0.0686	1038.1	2961.0	1038.1	2.4423	98.073	0.000	0.000	0.000
340.0	8.61%10	0.0645	1038.1	3000.0	1038.1	2.4800	98.073	0.000	0.000	0.000
345.0	8.22%10	0.0606	1038.1	3039.8	1038.1	2.5177	98.073	0.000	0.000	0.000
350.0	7.83%10	0.0567	1038.1	3079.6	1038.1	2.5554	98.073	0.000	0.000	0.000
355.0	7.44%10	0.0528	1038.1	3119.4	1038.1	2.5931	98.073	0.000	0.000	0.000
360.0	7.05%10	0.0489	1038.1	3159.2	1038.1	2.6308	98.073	0.000	0.000	0.000
365.0	6.66%10	0.0450	1038.1	3199.0	1038.1	2.6685	98.073	0.000	0.000	0.000
370.0	6.27%10	0.0411	1038.1	3238.8	1038.1	2.7062	98.073	0.000	0.000	0.000
375.0	5.88%10	0.0372	1038.1	3278.6	1038.1	2.7439	98.073	0.000	0.000	0.000
380.0	5.50%10	0.0333	1038.1	3318.4	1038.1	2.7816	98.073	0.000	0.000	0.000
385.0	5.11%10	0.0294	1038.1	3358.2	1038.1	2.8193	98.073	0.000	0.000	0.000
390.0	4.72%10	0.0255	1038.1	3398.0	1038.1	2.8570	98.073	0.000	0.000	0.000
395.0	4.33%10	0.0216	1038.1	3437.8	1038.1	2.8947	98.073	0.000	0.000	0.000
400.0	3.94%10	0.0177	1038.1	3477.6	1038.1	2.9324	98.073	0.000	0.000	0.000
405.0	3.55%10	0.0138	1038.1	3517.4	1038.1	2.9601	98.073	0.000	0.000	0.000
410.0	3.16%10	0.0099	1038.1	3557.2	1038.1	2.9978	98.073	0.000	0.000	0.000
415.0	2.77%10	0.0060	1038.1	3597.0	1038.1	3.0355	98.073	0.000	0.000	0.000
420.0	2.38%10	0.0021	1038.1	3636.8	1038.1	3.0732	98.073	0.000	0.000	0.000
425.0	1.99%10	0.0082	1038.1	3676.6	1038.1	3.1109	98.073	0.000	0.000	0.000
430.0	1.60%10	0.0143	1038.1	3716.4	1038.1	3.1486	98.073	0.000	0.000	0.000
435.0	1.21%10	0.0204	1038.1	3756.2	1038.1	3.1863	98.073	0.000	0.000	0.000
440.0	8.22%9	0.0265	1038.1	3796.0	1038.1	3.2240	98.073	0.000	0.000	0.000
445.0	4.33%9	0.0326	1038.1	3835.8	1038.1	3.2617	98.073	0.000	0.000	0.000
450.0	0.44%9	0.0387	1038.1	3875.6	1038.1	3.2994	98.073	0.000	0.000	0.000
455.0	-1.10%8	0.0448	1038.1	3915.4	1038.1	3.3371	98.073	0.000	0.000	0.000
460.0	-5.00%8	0.0509	1038.1	3955.2	1038.1	3.3748	98.073	0.000	0.000	0.000
465.0	-9.00%8	0.0570	1038.1	3995.0	1038.1	3.4125	98.073	0.000	0.000	0.000
470.0	-12.00%8	0.0631	1038.1	4034.8	1038.1	3.4402	98.073	0.000	0.000	0.000
475.0	-15.00%8	0.0692	1038.1	4074.6	1038.1	3.4779	98.073	0.000	0.000	0.000
480.0	-17.00%8	0.0753	1038.1	4114.4	1038.1	3.5156	98.073	0.000	0.000	0.000
485.0	-18.00%8	0.0814	1038.1	4154.2	1038.1	3.5533	98.073	0.000	0.000	0.000
490.0	-18.00%8	0.0875	1038.1	4194.0	1038.1	3.5910	98.073	0.000	0.000	0.000
495.0	-17.00%8	0.0936	1038.1	4233.8	1038.1	3.6287	98.073	0.000	0.000	0.000
500.0	-15.00%8	0.0997	1038.1	4273.6	1038.1	3.6664	98.073	0.000	0.000	0.000
505.0	-12.00%8	0.1058	1038.1	4313.4	1038.1	3.7041	98.073	0.000	0.000	0.000
510.0	-8.00%8	0.1119	1038.1	4353.2	1038.1	3.7418	98.073	0.000	0.000	0.000
515.0	-3.00%8	0.1180	1038.1	4393.0	1038.1	3.7795	98.073	0.000	0.000	0.000
520.0	2.00%8	0.1241	1038.1	4432.8	1038.1	3.8172	98.073	0.000	0.000	0.000
525.0	6.00%8	0.1302	1038.1	4472.6	1038.1	3.8549	98.073	0.000	0.000	0.000
530.0	10.00%8	0.1363	1038.1	4512.4	1038.1	3.8926	98.073	0.000	0.000	0.000
535.0	13.00%8	0.1424	1038.1	4552.2	1038.1	3.9293	98.073	0.000		

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH= 3 HOUR= 6.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MONIP= 50.8 MAGLA= 40.5 XHI= 90.0
 SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC. = -3.3
 NMF2=3.45% HMF1= 0.00% -01 NME=3.99% 10 NMDE=4.00% 08
 HMF2=292.6 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/HMAX	TN	TE	TI	TE/TI	RDO+	RDHF+	RDO2+	RDHF2+	RDNCF+
80.0	2.819%08	8.2%4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.101%08	0.0012	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.817%09	0.0053	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.250%10	0.0362	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.070%10	0.0889	-1	-1	-1	-1	0.012	0.000	0.000	0.000	0.000
105.0	3.950%10	0.1144	-1	-1	-1	-1	0.019	0.000	0.000	0.000	0.000
110.0	3.865%10	0.1120	-1	-1	-1	-1	0.030	0.000	0.000	0.000	0.000
115.0	3.211%10	0.0930	-1	-1	-1	-1	0.049	0.000	0.000	0.000	0.000
120.0	2.583%10	0.0748	322.0	322.0	0	1.0000	0.079	0.000	0.000	0.000	0.000
125.0	2.297%10	0.0665	375.0	391.1	375.0	1.0428	0.127	0.000	0.000	0.000	0.000
130.0	2.383%10	0.0690	426.7	458.8	426.7	1.0752	0.205	0.000	0.000	0.000	0.000
135.0	2.715%10	0.0786	476.1	524.2	476.1	1.1010	0.335	0.000	0.000	0.000	0.000
140.0	3.141%10	0.0910	521.4	585.6	521.4	1.1230	0.530	0.000	0.000	0.000	0.000
150.0	4.273%10	0.1238	597.6	693.8	597.6	1.1610	1.364	0.000	0.000	0.000	0.000
160.0	4.975%10	0.1441	655.4	783.7	655.4	1.1957	3.437	0.000	0.000	0.000	0.000
170.0	5.852%10	0.1695	699.4	859.7	699.4	1.2293	8.184	0.000	0.000	0.000	0.000
180.0	6.999%10	0.2027	733.4	925.8	733.4	1.2624	17.092	0.000	0.000	0.000	0.000
190.0	8.629%10	0.2500	760.3	984.8	760.3	1.2953	28.794	0.000	0.000	0.000	0.000
200.0	1.149%11	0.3327	782.0	1038.5	782.0	1.3281	39.129	0.000	0.000	0.000	0.000
210.0	1.523%11	0.4411	799.7	1088.3	799.7	1.3609	46.642	0.000	0.000	0.000	0.000
220.0	1.917%11	0.5554	814.3	1135.0	814.3	1.3928	52.531	0.000	0.000	0.000	0.000
230.0	2.305%11	0.6677	826.5	1179.2	830.0	1.4208	57.951	0.000	0.000	0.000	0.000
240.0	2.658%11	0.7699	836.5	1221.4	845.0	1.4454	63.480	0.000	0.000	0.000	0.000
250.0	3.181%11	0.9214	851.9	1300.9	875.0	1.4865	75.747	0.000	0.000	0.000	0.000
260.0	3.420%11	0.9907	862.6	1375.7	905.3	1.5197	89.778	0.000	0.000	0.000	0.000
270.0	3.446%11	0.9982	870.0	1447.3	935.4	1.5473	98.000	0.000	0.000	0.000	0.000
280.0	3.372%11	0.9769	875.3	1516.7	965.5	1.5710	98.535	0.000	0.000	0.000	0.000
290.0	3.225%11	0.9341	879.1	1584.7	995.6	1.5917	98.545	0.000	0.000	0.000	0.000
300.0	3.020%11	0.9214	881.8	1635.0	1025.7	1.6485	75.747	0.000	0.000	0.000	0.000
310.0	2.778%11	0.8046	883.8	1668.7	1055.8	1.5197	89.778	0.000	0.000	0.000	0.000
320.0	2.517%11	0.7292	885.3	1702.4	1085.9	1.5473	98.000	0.000	0.000	0.000	0.000
330.0	2.255%11	0.6534	886.4	1722.3	1116.0	1.5710	98.535	0.000	0.000	0.000	0.000
340.0	2.005%11	0.5807	887.3	1742.2	1146.0	1.5917	98.545	0.000	0.000	0.000	0.000
350.0	1.773%11	0.5135	888.0	1762.1	1176.1	1.6205	1.5941	0.000	0.000	0.000	0.000
360.0	1.565%11	0.4532	888.5	1782.1	1206.1	1.6476	1.5806	0.000	0.000	0.000	0.000
370.0	1.381%11	0.4002	888.9	1802.1	1236.1	1.6776	1.5678	0.000	0.000	0.000	0.000
380.0	1.223%11	0.3542	889.2	1822.1	1266.1	1.7079	1.5433	0.000	0.000	0.000	0.000
390.0	1.087%11	0.3148	889.5	1842.1	1296.1	1.7302	1.4392	0.000	0.000	0.000	0.000
400.0	9.709%10	0.2813	889.7	1862.1	1326.1	1.7623	1.4213	0.000	0.000	0.000	0.000
410.0	8.730%10	0.2529	889.9	1882.1	1356.1	1.7976	1.4042	0.000	0.000	0.000	0.000
420.0	7.904%10	0.2290	890.0	1902.1	1386.1	1.8266	1.3879	0.000	0.000	0.000	0.000
430.0	7.207%10	0.2088	890.2	1922.1	1416.1	1.8573	1.3573	0.000	0.000	0.000	0.000
440.0	6.619%10	0.1917	890.3	1942.1	1446.1	1.8870	1.3430	0.000	0.000	0.000	0.000
450.0	6.123%10	0.1774	890.3	1962.1	1476.1	1.9190	1.3293	0.000	0.000	0.000	0.000
460.0	5.703%10	0.1652	890.4	1982.1	1506.1	1.9530	1.3161	0.000	0.000	0.000	0.000
470.0	5.347%10	0.1549	890.5	2002.1	1536.1	1.9834	1.3034	0.000	0.000	0.000	0.000
480.0	5.045%10	0.1462	890.5	2022.1	1566.1	2.0151	1.2912	0.000	0.000	0.000	0.000
490.0	4.788%10	0.1387	890.6	2042.1	1596.1	2.0474	1.2794	0.000	0.000	0.000	0.000
500.0	4.569%10	0.1324	890.6	2062.1	1626.1	2.0800	1.2681	0.000	0.000	0.000	0.000
510.0	4.381%10	0.1269	890.7	2082.1	1656.1	2.1257	1.2572	0.000	0.000	0.000	0.000
520.0	4.220%10	0.1223	890.7	2102.1	1686.1	2.1467	1.2467	0.000	0.000	0.000	0.000
WE PUT Bl#	3.070	GET HST									

INPUT: LAT1= 44.1 LONG1= 2.0 R=100 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT = 46.6 MLDIP = 83.1
 DIP = 59.6 MODIP = 50.8 MAGLA = 40.5 XH1 = 139.2
 SUNRISE = 6:2 L.T. SUNSET = 17:8 L.T. SUN DEC. = -3.3
 NMFD2 = 3.28% NMFF1 = 0.00% NM = 3.20% NMID = 4.00% NM08
 NMFD3 = 2.78 HME = 0.0 HME = 105.0 HMD = 88.0

TNPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH= 6 HOUR=12.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 21.0
 SUNRISE: 4:4 L.T. SUNSET:19.6 L.T. SUN DEC.= 23.1
 NMF1=6.78%11 NMF1= 3.53%11 NMD=1.32%09
 HMF2=273.9 HMF1=182.5 HMD= 81.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDD*	RDE+	RDD2+	RDN+
80.0	1.255%09	0.0019	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.646%09	0.0039	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.539%10	0.0374	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.631%10	0.1273	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.459%11	0.2152	-1	-1	-1	-1	0.336	0.000	0.000	58.280	41.384
105.0	1.693%11	0.2497	-1	-1	-1	-1	0.482	0.000	0.000	51.969	47.549
110.0	1.716%11	0.2532	-1	-1	-1	-1	0.691	0.000	0.000	46.478	52.831
115.0	1.672%11	0.2467	-1	-1	-1	-1	0.989	0.000	0.000	41.850	57.161
120.0	1.640%11	0.2419	339.1	339.1	1.00000	1.415	0.000	0.000	0.000	38.161	60.424
125.0	1.702%11	0.2510	398.7	398.7	1.0553	2.024	0.000	0.000	0.000	35.377	62.599
130.0	1.790%11	0.2640	456.9	501.0	456.9	1.0965	2.887	0.000	0.000	33.262	63.851
135.0	1.877%11	0.2768	513.1	579.3	513.1	1.1289	4.107	0.000	0.000	31.530	64.363
140.0	1.975%11	0.2913	566.0	654.2	566.0	1.1558	5.809	0.000	0.000	30.000	64.191
150.0	2.222%11	0.3277	658.6	790.9	658.6	1.2009	11.251	0.000	0.000	27.252	61.497
160.0	2.579%11	0.3805	733.1	909.5	733.1	1.2406	19.962	0.000	0.000	24.758	55.281
170.0	3.055%11	0.4505	792.5	1013.0	792.5	1.2782	30.669	0.000	0.000	22.334	46.996
180.0	3.499%11	0.5160	840.1	1104.7	840.1	1.3150	40.806	0.000	0.000	19.181	40.012
190.0	3.989%11	0.5884	878.7	1187.4	878.7	1.3513	49.733	0.000	0.000	12.935	37.332
200.0	4.614%11	0.6806	910.5	1263.3	910.5	1.3875	58.000	0.000	0.000	5.514	36.134
210.0	5.168%11	0.7652	936.8	1333.7	936.8	1.4237	67.504	0.000	0.000	1.846	30.650
220.0	5.685%11	0.8386	958.7	1399.7	958.7	1.4600	77.593	0.000	0.000	0.588	21.819
230.0	6.091%11	0.8984	976.9	1462.0	976.9	1.4965	88.070	0.000	0.000	0.186	11.744
240.0	6.398%11	0.9436	992.2	1521.4	992.2	1.5334	95.635	0.000	0.000	0.059	4.306
260.0	6.727%11	0.9923	1015.5	1632.9	1015.5	1.6059	98.527	0.000	0.000	0.006	1.467
280.0	6.771%11	0.9987	1031.8	1737.4	1040.7	1.6694	98.595	0.000	0.000	0.001	1.404
300.0	6.621%11	0.9766	1043.2	1837.0	1064.6	1.7256	98.596	0.731	0.081	0.000	0.592
320.0	6.308%11	0.9303	1051.3	1933.3	1088.5	1.7761	98.596	1.211	0.135	0.000	0.059
340.0	5.869%11	0.8657	1057.1	2027.3	1112.6	1.8221	98.594	1.260	0.140	0.000	0.006
360.0	5.351%11	0.7892	1061.2	2092.9	1137.1	1.8405	98.593	1.266	0.141	0.000	0.001
380.0	4.796%11	0.7074	1064.3	2131.9	1162.7	1.8335	98.590	1.269	0.141	0.000	0.000
400.0	4.242%11	0.6257	1066.6	2171.4	1191.0	1.8721	98.586	1.272	0.141	0.000	0.000
420.0	3.716%11	0.5482	1068.3	2211.0	1224.7	1.8854	98.578	1.280	0.142	0.000	0.000
440.0	3.236%11	0.4773	1069.6	2250.8	1266.6	1.7771	98.454	1.391	0.155	0.000	0.000
460.0	2.809%11	0.4143	1070.6	2290.7	1316.7	1.7398	97.398	2.342	0.260	0.000	0.000
480.0	2.438%11	0.3596	1071.4	2330.6	1372.2	1.6985	95.879	3.709	0.412	0.000	0.000
500.0	2.120%11	0.3127	1072.1	2370.6	1430.4	1.6573	94.357	5.079	0.564	0.000	0.000
520.0	1.852%11	0.2731	1072.6	2410.5	1489.6	1.6182	92.846	6.438	0.715	0.000	0.000
540.0	1.626%11	0.2361	1073.0	2450.5	1549.3	1.5816	91.342	7.793	0.866	0.000	0.000
560.0	1.438%11	0.2121	1074.2	2490.4	1609.2	1.5476	89.836	9.148	1.016	0.000	0.000
580.0	1.281%11	0.1889	1073.3	2530.4	1669.1	1.5160	88.318	10.514	1.168	0.000	0.000
600.0	1.150%11	0.1696	1073.8	2570.3	1729.0	1.4866	86.776	11.902	1.322	0.000	0.000
620.0	1.040%11	0.1535	1074.0	2610.3	1788.9	1.4591	85.194	13.326	1.481	0.000	0.000
640.0	9.490%10	0.1400	1074.2	2650.3	1848.9	1.4334	83.554	14.801	1.645	0.000	0.000
660.0	8.724%10	0.1287	1074.3	2690.2	1908.8	1.4094	81.841	16.344	1.816	0.000	0.000
680.0	8.081%10	0.1192	1074.4	2730.2	1968.8	1.3868	80.040	17.964	1.996	0.000	0.000
700.0	7.539%10	0.1112	1074.5	2770.1	2028.7	1.3655	78.147	19.668	2.185	0.000	0.000
720.0	7.080%10	0.1044	1074.6	2810.1	2088.6	1.3454	76.169	21.448	2.383	0.000	0.000
740.0	6.691%10	0.0987	1074.7	2850.1	2148.6	1.3265	74.121	23.292	2.588	0.000	0.000
760.0	6.360%10	0.0938	1074.7	2890.0	2208.5	1.3086	72.025	25.177	2.797	0.000	0.000
780.0	6.078%10	0.0896	1074.8	2930.0	2268.5	1.2916	69.908	27.083	3.009	0.000	0.000
800.0	5.836%10	0.0861	1074.8	2969.9	2328.4	1.2755	67.792	3.221	3.000	0.000	0.000

WE PUT Bl= 3.0TU GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH= 6 HOUR= 4.4

CALCULATED VALUES! MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 90.0
 SUNRISE: 4:4 L.T. SUNSET:19:6 L.T. SUN DEC= 23.1
 NMFL2=4.09% NMFL1= 0.00%-01 NMFL3=3.84%10 NMFL4=4.00%08
 NMFL5=2.2 HMDL1= 0.0 HMDL2=107.5 HMDL3= 84.5

RDNO+		RDO2+		RDHE+		RDO2+		RDHE+		TE/TI		TN		NE	
=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1	=1
0.0	2.819%	0.8	6.9%	-4	20.0	4.101%	0.8	0.0010	-1	0.0	H	0.0	N/NMAX	NE	H
0.5	4.101%	0.8	0.0010	-1	0.0	1.816%	0.9	0.0044	-1	0.0	0.0	0.0	0.0	0.0	0.0
1.0	4.235%	1.0	0.0302	-1	0.0	2.983%	1.0	0.0730	-1	0.0	0.0	0.0	0.0	0.0	0.0
1.5	4.463%	1.2	0.0562	-1	0.0	3.802%	1.0	0.0931	-1	0.0	0.0	0.0	0.0	0.0	0.0
2.0	4.682%	1.8	0.0642	-1	0.0	3.718%	1.0	0.0910	-1	0.0	0.0	0.0	0.0	0.0	0.0
2.5	4.829%	5.5	0.0745	-1	0.0	3.091%	1.0	0.0757	-1	0.0	0.0	0.0	0.0	0.0	0.0
3.0	4.968%	10	0.042%	1.0	0.0	2.486%	1.0	0.0609	325.0	0	0.000	325.0	0	0.000	0.0
3.5	5.105%	10	0.0541	-1	0.0	3.944%	1.0	0.0965	608.4	379.3	394.8	379.3	0.016	0.000	0.0
4.0	5.242%	1.2	0.0562	-1	0.0	2.294%	1.0	0.1108	669.1	463.1	432.2	432.2	0.025	0.000	0.0
4.5	5.379%	1.0	0.1280	-1	0.0	5.229%	1.0	0.1280	715.6	870.4	482.8	529.2	0.040	0.000	0.0
5.0	5.517%	7	0.1492	-1	0.0	6.096%	1.0	0.1492	751.7	937.5	751.7	751.7	0.064	0.000	0.0
5.5	5.655%	10	0.1763	-1	0.0	7.203%	1.0	0.1763	780.5	997.2	780.5	780.5	0.101	0.000	0.0
6.0	5.793%	10	0.2131	-1	0.0	8.704%	1.0	0.2131	803.7	1051.4	803.7	803.7	0.159	0.000	0.0
6.5	5.931%	10	0.2709	-1	0.0	1.107%	1.1	0.2709	822.8	1101.4	822.8	822.8	0.252	0.000	0.0
7.0	6.069%	1.1	0.3585	-1	0.0	1.465%	1.1	0.3585	838.5	1148.1	838.5	838.5	0.397	0.000	0.0
7.5	6.207%	1.1	0.4550	-1	0.0	1.859%	1.1	0.4550	851.5	1192.1	852.4	852.4	0.623	0.000	0.0
8.0	6.345%	1.1	0.5553	-1	0.0	2.268%	1.1	0.5553	862.4	1233.9	866.4	866.4	1.1526	0.000	0.0
8.5	6.483%	1.1	0.646%	1.1	0.0	3.046%	1.1	0.7457	878.9	1312.3	894.2	894.2	1.1851	0.000	0.0
9.0	6.621%	1.1	0.8913	-1	0.0	3.641%	1.1	0.8913	890.4	1385.8	922.1	922.1	1.2163	0.000	0.0
9.5	6.759%	1.1	0.9738	-1	0.0	3.978%	1.1	0.9738	898.5	1455.7	950.0	950.0	1.2471	0.000	0.0
10.0	6.897%	1.1	0.9997	-1	0.0	4.084%	1.1	0.9997	904.2	1523.4	977.9	977.9	1.2777	0.000	0.0
10.5	7.035%	1.1	0.9901	-1	0.0	4.045%	1.1	0.9901	908.3	1589.3	1005.7	1005.7	1.4242	0.000	0.0
11.0	7.173%	1.1	0.9554	-1	0.0	3.903%	1.1	0.9554	911.2	1638.0	1033.6	1033.6	1.4675	0.000	0.0
11.5	7.311%	1.1	0.9003	-1	0.0	3.678%	1.1	0.9003	913.4	1670.2	1061.6	1061.6	1.5028	0.000	0.0
12.0	7.449%	1.1	0.8311	-1	0.0	3.395%	1.1	0.8311	915.0	1702.4	1089.7	1089.7	1.5324	0.000	0.0
12.5	7.587%	1.1	0.7541	-1	0.0	3.081%	1.1	0.7541	916.2	1722.3	1118.2	1118.2	1.5402	0.000	0.0
13.0	7.725%	1.1	0.6751	-1	0.0	2.758%	1.1	0.6751	917.1	1742.2	1147.2	1147.2	1.5188	0.000	0.0
13.5	7.863%	1.1	0.5987	-1	0.0	2.446%	1.1	0.5987	917.8	1762.2	1176.5	1176.5	1.5847	0.000	0.0
14.0	7.981%	1.1	0.5277	-1	0.0	2.156%	1.1	0.5277	918.4	1782.1	1206.3	1206.3	1.6497	0.000	0.0
14.5	8.119%	1.1	0.4639	-1	0.0	2.080%	1.1	0.4639	918.8	1802.1	1236.2	1236.2	1.6474	0.000	0.0
15.0	8.257%	1.1	0.4079	-1	0.0	1.895%	1.1	0.4079	919.1	1822.1	1266.1	1266.1	1.4391	0.000	0.0
15.5	8.395%	1.1	0.3596	-1	0.0	1.666%	1.1	0.3596	919.5	1842.1	1296.1	1296.1	1.4213	0.000	0.0
16.0	8.533%	1.1	0.3183	-1	0.0	1.469%	1.1	0.3183	919.7	1862.1	1326.1	1326.1	1.4042	0.000	0.0
16.5	8.671%	1.1	0.2835	-1	0.0	1.301%	1.1	0.2835	919.9	1882.1	1356.1	1356.1	1.3879	0.000	0.0
17.0	8.809%	1.1	0.2542	-1	0.0	1.039%	1.1	0.2542	920.1	1902.1	1436.1	1436.1	1.4391	0.000	0.0
17.5	8.947%	1.1	0.2297	-1	0.0	0.382%	1.0	0.2297	920.2	1922.1	1416.1	1416.1	1.3573	0.000	0.0
18.0	9.085%	1.1	0.2091	-1	0.0	0.542%	1.0	0.2091	920.3	1942.1	1446.1	1446.1	1.3430	0.000	0.0
18.5	9.223%	1.1	0.1919	-1	0.0	0.446%	1.1	0.1919	920.4	1962.1	1476.1	1476.1	1.3292	0.000	0.0
19.0	9.361%	1.1	0.1747	-1	0.0	0.247%	1.0	0.1747	920.5	1982.1	1506.1	1506.1	1.3160	0.000	0.0
19.5	9.5%	1.1	0.158%	-1	0.0	0.158%	1.1	0.158%	920.6	2002.1	1536.1	1536.1	1.2939	0.000	0.0
20.0	9.634%	1.1	0.142%	-1	0.0	0.099%	1.1	0.142%	920.7	2022.1	1566.1	1566.1	1.2912	0.000	0.0
20.5	9.781%	1.1	0.126%	-1	0.0	0.066%	1.1	0.126%	920.8	2042.1	1596.1	1596.1	1.2794	0.000	0.0
21.0	9.929%	1.1	0.110%	-1	0.0	0.046%	1.1	0.110%	920.9	2062.1	1626.1	1626.1	1.2681	0.000	0.0
21.5	1.000%	1.1	0.094%	-1	0.0	0.030%	1.1	0.094%	921.0	2082.1	1656.1	1656.1	1.2572	0.000	0.0
22.0	1.058%	1.1	0.078%	-1	0.0	0.020%	1.1	0.078%	921.1	2102.1	1686.1	1686.1	1.2467	0.000	0.0

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 46.6 MLDIP= 50.8 MAGLA= 40.5 XH= 112.8
 DIP= 59.6 MUDIP= 50.8 SUNSET= 19.6 L.T. SUN DEC.= 23.1
 SUNRISE= 4.4 L.T. NMF1= 0.00% T1 NME= 3.20% T0 NMD= 4.00% T0
 NMF2= 5.25% T1 NMF1= 0.00% T0 NME= 3.20% T0 NMD= 4.00% T0
 HMF2= 346.8 HMF1= 0.0 HME= 105.1 HMD= 87.9

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD4+	RDH4	RDD2+	RDN0+
80.0	9.273%05	1.8%~6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.588%08	4.9%~4	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.783%08	9.1%~4	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.536%09	0.0048	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.194%09	0.0061	-1	-1	-1	-1	0.016	0.000	6.623	93.361
105.0	3.201%09	0.0061	-1	-1	-1	-1	0.025	0.000	8.541	91.434
110.0	2.632%09	0.0050	-1	-1	-1	-1	0.040	0.000	10.994	88.966
115.0	1.728%09	0.0033	-1	-1	-1	-1	0.064	0.000	14.085	85.852
120.0	1.109%09	0.0021	324.1	324.1	1.0000	1.0000	0.101	0.000	17.829	82.070
125.0	7.873%08	0.0015	378.0	378.0	1.0160	1.0160	0.160	0.000	21.966	77.875
130.0	6.561%08	0.0012	430.6	442.6	1.0281	1.0252	0.252	0.000	25.782	73.966
135.0	6.484%08	0.0012	480.8	498.9	1.0377	0.397	0.000	0.000	28.494	71.109
140.0	7.405%08	0.0014	527.1	551.3	1.0458	0.623	0.000	0.000	30.000	69.377
145.0	1.227%09	0.0023	605.2	641.5	1.0599	1.499	0.000	0.000	31.125	67.376
150.0	2.041%09	0.0039	665.2	673.4	1.0726	3.369	0.000	0.000	31.523	65.108
155.0	3.329%09	0.0063	710.8	771.2	1.0850	6.682	0.000	0.000	31.631	61.688
160.0	7.119%09	0.0136	746.3	818.8	1.0971	11.440	0.000	0.000	30.463	58.096
165.0	1.399%10	0.0266	774.5	859.0	1.1092	17.675	0.000	0.000	24.037	58.288
170.0	2.542%10	0.0484	797.2	893.9	1.1212	26.016	0.000	0.000	12.998	60.985
175.0	4.297%10	0.0819	815.9	924.6	1.1332	37.577	0.000	0.000	5.759	56.664
180.0	6.796%10	0.1295	831.3	952.1	1.1453	53.695	0.000	0.000	2.450	43.855
185.0	1.013%11	0.1930	844.1	976.9	1.1574	74.407	0.000	0.000	1.036	24.556
190.0	1.430%11	0.2724	854.7	999.6	1.1695	92.029	0.000	0.000	0.438	7.533
195.0	2.456%11	0.4679	870.9	1040.0	1.1889	99.254	0.000	0.000	0.078	0.667
200.0	3.553%11	0.6769	882.1	1075.4	1.2019	97.970	1.679	0.187	0.014	0.151
205.0	4.466%11	0.8507	890.0	1107.4	1.2107	95.560	3.969	0.441	0.002	0.027
210.0	5.029%11	0.9579	895.6	1137.1	1.2166	93.146	6.164	0.685	0.000	0.005
215.0	5.239%11	1.0274	854.7	999.6	1.1695	92.029	0.000	0.000	0.000	0.000
220.0	5.215%11	0.9935	902.4	1192.3	1.2239	88.437	10.406	1.156	0.000	0.000
225.0	5.043%11	0.9607	904.5	1218.6	1.2308	86.124	12.468	1.388	0.000	0.000
230.0	4.751%11	0.9050	906.1	1244.3	1.2308	83.819	14.563	1.618	0.000	0.000
235.0	4.374%11	0.8333	907.3	1244.8	1.2136	81.500	16.650	1.850	0.000	0.000
240.0	3.952%11	0.9979	899.5	1165.3	954.6	1.2207	90.774	8.302	0.922	0.000
245.0	3.215%11	0.6779	900.5	1192.3	1.2239	88.437	10.406	1.156	0.000	0.000
250.0	3.519%11	0.6704	908.9	1245.8	1.2042	1.1955	76.705	20.966	2.330	0.000
255.0	3.101%11	0.5908	909.4	1246.3	1.2045	1.1924	74.146	23.268	2.585	0.000
260.0	2.716%11	0.5174	909.9	1246.9	1.2046	1.1910	71.414	25.727	2.859	0.000
265.0	2.372%11	0.4519	910.2	1247.3	1.2036	1.1902	68.456	28.389	3.154	0.000
270.0	2.074%11	0.3950	910.5	1247.8	1.2048	1.1896	65.232	31.292	3.477	0.000
275.0	1.818%11	0.3464	910.7	1248.3	1.2049	1.1892	61.723	34.449	3.828	0.000
280.0	1.603%11	0.3053	910.9	1248.8	1.2050	1.1888	57.954	37.842	4.205	0.000
285.0	1.422%11	0.2709	911.1	1249.3	1.2051	1.1884	53.987	41.412	4.601	0.000
290.0	1.271%11	0.2422	911.2	1249.8	1.2052	1.1881	49.918	45.074	5.008	0.000
295.0	1.146%11	0.2183	911.3	1250.3	1.2053	1.1877	45.857	48.729	5.414	0.000
300.0	1.042%11	0.1985	911.4	1250.8	1.2054	1.1873	41.906	52.290	5.810	0.000
305.0	1.000%11	0.1820	911.5	1251.3	1.2054	1.1869	38.126	55.687	6.187	0.000
310.0	8.834%10	0.1683	911.6	1251.8	1.2054	1.1866	34.584	58.875	6.542	0.000
315.0	8.231%10	0.1568	911.6	1252.3	1.2055	1.1862	31.300	61.830	6.870	0.000
320.0	7.727%10	0.1472	911.7	1252.8	1.2056	1.1858	28.283	64.545	7.172	0.000
325.0	7.303%10	0.1391	911.7	1253.3	1.2057	1.1855	25.529	67.024	7.447	0.000
330.0	6.946%10	0.1323	911.7	1253.8	1.2057	1.1851	23.026	69.277	7.697	0.000
335.0	6.644%10	0.1266	911.8	1254.3	1.2058	1.1847	20.757	71.319	7.924	0.000
340.0	6.301%10	0.1219	911.8	1254.8	1.2059	1.1843	18.914	69.808	7.924	0.000
345.0	5.958%10	0.1172	911.9	1255.3	1.2060	1.1839	17.414	68.314	7.924	0.000
350.0	5.615%10	0.1125	911.9	1255.8	1.2061	1.1835	16.124	67.824	7.924	0.000
355.0	5.272%10	0.1078	912.0	1256.3	1.2062	1.1831	15.034	67.334	7.924	0.000
360.0	4.929%10	0.1031	912.0	1256.8	1.2063	1.1827	14.044	66.844	7.924	0.000
365.0	4.586%10	0.0984	912.1	1257.3	1.2064	1.1823	13.154	66.354	7.924	0.000
370.0	4.243%10	0.0937	912.1	1257.8	1.2065	1.1819	12.364	65.864	7.924	0.000
375.0	3.900%10	0.0890	912.2	1258.3	1.2066	1.1815	11.674	65.374	7.924	0.000
380.0	3.557%10	0.0843	912.2	1258.8	1.2067	1.1811	11.084	64.884	7.924	0.000
385.0	3.214%10	0.0796	912.3	1259.3	1.2068	1.1807	10.594	64.394	7.924	0.000
390.0	2.871%10	0.0750	912.3	1259.8	1.2069	1.1803	10.104	63.904	7.924	0.000
395.0	2.528%10	0.0703	912.4	1260.3	1.2070	1.18	9.714	63.414	7.924	0.000
400.0	2.185%10	0.0656	912.4	1260.8	1.2071	1.18	9.324	62.924	7.924	0.000
405.0	1.842%10	0.0610	912.5	1261.3	1.2072	1.18	8.934	62.434	7.924	0.000
410.0	1.500%10	0.0563	912.5	1261.8	1.2073	1.18	8.544	61.944	7.924	0.000
415.0	1.157%10	0.0516	912.6	1262.3	1.2074	1.18	8.154	61.454	7.924	0.000
420.0	8.214%10	0.0469	912.6	1262.8	1.2075	1.18	7.764	60.964	7.924	0.000
425.0	4.771%10	0.0422	912.7	1263.3	1.2076	1.18	7.374	60.474	7.924	0.000
430.0	1.328%10	0.0375	912.7	1263.8	1.2077	1.18	6.984	59.984	7.924	0.000
435.0	7.895%10	0.0328	912.8	1264.3	1.2078	1.18	6.594	59.494	7.924	0.000
440.0	2.452%10	0.0281	912.8	1264.8	1.2079	1.18	6.204	58.904	7.924	0.000
445.0	7.459%10	0.0234	912.9	1265.3	1.2080	1.18	5.814	58.414	7.924	0.000
450.0	2.126%10	0.0187	912.9	1265.8	1.2081	1.18	5.424	57.924	7.924	0.000
455.0	7.033%10	0.0140	913.0	1266.3	1.2082	1.18	5.034	57.434	7.924	0.000
460.0	2.800%10	0.0093	913.0	1266.8	1.2083	1.18	4.644	56.944	7.924	0.000
465.0	7.597%10	0.0046	913.1	1267.3	1.2084	1.18	4.254	56.454	7.924	0.000
470.0	2.574%10	0.0000	913.1	1267.8	1.2085	1.18	3.864	55.964	7.924	0.000
475.0	7.391%10	0.0000	913.2	1268.3	1.2086	1.18	3.474	55.474	7.924	0.000
480.0	2.348%10	0.0000	913.2	1268.8	1.2087	1.18	3.084	54.984	7.924	0.000
485.0	7.195%10	0.0000	913.3	1269.3	1.2088	1.18	2.694	54.494	7.924	0.000
490.0	2.162%10	0.0000	913.3	1269.8	1.2089	1.18	2.304	53.994	7.924	0.000
495.0	7.008%10	0.0000	913.4	1270.3	1.2090	1.18	1.914	53.504	7.924	0.000
500.0	1.975%10	0.0000	913.4	1270.8	1.2091	1.18	1.524	53.014	7.924	0.000
505.0	6.942%10	0.0000	913.5	1271.3	1.2092	1.18	1.134	52.524	7.924	0.000
510.0	1.809%10	0.0000	913.5	1271.8	1.2093	1.18	0.744	52.034	7.924	0.000
515.0	6.915%10	0.0000	913.6	1272.3	1.2094	1.18	0.354	51.544	7.924	0.000
520.0	1.786%10	0.0000	913.6	1272.8	1.2095	1.18	0.000	51.054	7.924	0.000
525.0	6.893%10	0.0000	913.7	1273.3	1.2096	1.18	0.314	50.564	7.924	0.000
530.0	1.764%10	0.0000	913.7	1273.8	1.2097	1.18	0.924	50.074	7.924	0.000
535.0	6.870%10	0.0000	913.8	1274.3	1.2098					

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLAF 40.5 XHI= 67.0
 SUNRISE: 7.6 L.T. SUNSET: 16.4 L.T. SUN DEC. = -22.9
 NMF1= 0.000% 01 NMF2= 1.13% 11 NMD= 4.18% 08
 HMF2= 1.26% 12 NMF1= 0.000% 01 NMF2= 1.13% 11 NMD= 4.18% 08
 HMF2= 256.8 HMF1= 0.0 HME= 109.9 HMD= 81.2

	H	NE	N/NMAX	TN	TE	TI	TE/TI		RDD+	RDH+	RDH+	RDD2+	RDD+	RDD+			
80.0	3.949%08	3.1%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
85.0	7.842%08	6.2%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
90.0	8.390%09	0.0067	-1	-1	-1	-1	-1	-1	0.247	0.000	0.000	35.877	63.876	63.876			
95.0	3.746%10	0.0646	-1	-1	-1	-1	-1	-1	0.371	0.000	0.000	37.874	61.755	61.755			
100.0	8.133%10	0.0862	-1	-1	-1	-1	-1	-1	0.559	0.000	0.000	39.960	59.481	59.481			
105.0	1.085%11	0.0898	-1	-1	-1	-1	-1	-1	0.842	0.000	0.000	42.100	57.058	57.058			
110.0	1.130%11	0.0844	-1	-1	-1	-1	-1	-1	0.000	0.000	0.000	44.189	54.544	54.544			
115.0	1.063%11	0.0802	332.7	332.7	1.00000	1.267	0.000	0.000	0.000	0.000	0.000	35.877	52.131	52.131			
120.0	1.010%11	0.0864	389.9	413.0	389.9	1.0593	1.904	0.000	0.000	0.000	0.000	0.000	46.938	50.203	50.203		
125.0	1.088%11	0.1585	445.7	491.9	445.7	1.1038	2.859	0.000	0.000	0.000	0.000	0.000	46.609	49.108	49.108		
130.0	1.225%11	0.0973	568.8	499.4	1.1389	4.283	0.000	0.000	0.000	0.000	0.000	0.000	45.000	48.611	48.611		
135.0	1.319%11	0.1047	499.4	549.5	1.1683	6.389	0.000	0.000	0.000	0.000	0.000	0.000	39.937	46.188	46.188		
140.0	1.423%11	0.1130	549.5	642.0	1.1683	13.875	0.000	0.000	0.000	0.000	0.000	0.000	33.943	38.099	38.099		
150.0	1.672%11	0.1328	635.8	774.5	635.8	1.2182	27.958	0.000	0.000	0.000	0.000	0.000	25.234	26.516	26.516		
160.0	1.995%11	0.1585	703.9	888.9	703.9	1.2628	48.250	0.000	0.000	0.000	0.000	0.000	14.234	18.435	18.435		
170.0	2.450%11	0.1946	757.1	988.4	757.1	1.3054	67.331	0.000	0.000	0.000	0.000	0.000	6.832	16.199	16.199		
180.0	3.241%11	0.2574	799.2	1076.7	799.2	1.3472	78.969	0.000	0.000	0.000	0.000	0.000	3.167	12.254	12.254		
190.0	4.878%11	0.3874	833.0	1156.8	833.0	1.3887	84.579	0.000	0.000	0.000	0.000	0.000	1.461	11.170	11.170		
200.0	6.739%11	0.5353	860.6	1230.6	860.6	1.4299	87.369	0.000	0.000	0.000	0.000	0.000	0.673	10.220	10.220		
210.0	8.586%11	0.6820	883.3	1299.6	883.3	1.4712	89.107	0.000	0.000	0.000	0.000	0.000	0.310	9.201	9.201		
220.0	1.020%12	0.8100	902.2	1364.7	902.2	1.5127	90.488	0.000	0.000	0.000	0.000	0.000	0.143	8.096	8.096		
230.0	1.142%12	0.9069	917.8	1426.6	917.8	1.5542	91.761	0.000	0.000	0.000	0.000	0.000	0.030	5.716	5.716		
240.0	1.218%12	0.9677	920.9	1485.9	920.9	1.5930	92.633	0.000	0.000	0.000	0.000	0.000	0.000	3.284	3.284		
260.0	1.259%12	0.9996	950.9	1598.4	962.5	1.6606	94.254	0.000	0.000	0.000	0.000	0.000	0.000	1.999	1.999		
280.0	1.234%12	0.9798	964.8	1704.8	992.3	1.7181	96.709	0.000	0.000	0.000	0.000	0.000	0.000	1.920	1.920		
300.0	1.175%12	0.9330	974.5	1807.0	902.0	1.7681	98.000	0.000	0.000	0.000	0.000	0.000	0.000	0.919	0.919		
320.0	1.090%12	0.8655	981.4	1906.4	1051.8	1.8125	98.801	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
340.0	9.880%11	0.7847	986.3	2003.8	1081.8	1.8523	98.081	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
360.0	8.786%11	0.6979	989.9	2071.2	1112.1	1.8625	98.079	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.041		
380.0	7.694%11	0.6111	992.5	2110.0	1143.2	1.8457	98.076	1.694	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
400.0	6.661%11	0.5291	994.4	2149.2	1176.5	1.8268	98.072	1.727	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
420.0	5.722%11	0.4545	995.9	2187.9	1214.1	1.8022	98.064	1.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
440.0	4.895%11	0.3888	997.0	2226.8	1258.2	1.7698	97.941	1.753	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
460.0	4.183%11	0.3322	997.9	2265.7	1308.9	1.7311	96.890	2.799	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
480.0	3.580%11	0.2843	998.6	2304.7	1363.9	1.6898	95.379	4.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
500.0	3.075%11	0.2443	999.1	2343.7	1421.0	1.6493	93.865	5.521	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
520.0	2.656%11	0.2110	999.5	2382.7	1479.0	1.6110	92.362	6.874	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
540.0	2.310%11	0.1835	999.9	2421.7	1537.3	1.5753	90.866	8.221	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
560.0	2.025%11	0.1608	1000.2	2460.7	1595.7	1.5420	89.367	9.569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
580.0	1.769%11	0.1421	1000.4	2499.7	1654.2	1.5111	87.858	10.928	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
600.0	1.595%11	0.1267	1000.6	2538.7	1712.8	1.4823	86.324	12.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
620.0	1.434%11	0.1139	1000.7	2577.8	1771.3	1.4553	84.750	13.725	1.525	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
640.0	1.301%11	0.1033	1000.9	2616.8	1829.8	1.4301	83.119	15.193	1.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
660.0	1.189%11	0.0945	1001.0	2655.8	1888.3	1.4064	81.414	16.727	1.859	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
680.0	1.096%11	0.0871	1001.1	2694.8	1946.9	1.3842	79.623	18.340	2.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
700.0	1.018%11	0.0809	1001.2	2733.8	2005.4	1.3632	77.740	20.034	2.226	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
720.0	9.524%10	0.0756	1001.2	2772.8	2063.9	1.3435	75.772	21.805	2.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
740.0	8.968%10	0.0712	1001.3	2811.9	2122.4	1.3248	73.734	23.639	2.627	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
760.0	8.495%10	0.0675	1001.4	2850.9	2181.0	1.3072	71.650	25.515	2.835	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
780.0	8.092%10	0.0643	1001.4	2889.9	2239.5	1.2904	69.544	27.411	3.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
800.0	7.747%10	0.0615	1001.4	2928.9	2298.0	1.2745	67.438	29.305	3.256	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH=12 HOUR= 7.6

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 90.0
 SUNRISE: 7:6 L.T. SUNSET: 16:4 L.T.
 NMF2=5.14% HMF1= 0.000% HME=4.27% NHD=4.00%
 HMF2=258.8 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDH+	RDHE+	RDD2+	RDH2+	RDHE2+
80.0	2.819%08	5.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.101%08	8.0%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.817%09	0.0035	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.276%10	0.0248	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.223%10	0.0627	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	4.216%10	0.0820	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	4.125%10	0.0802	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	3.391%10	0.0660	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	2.684%10	0.0522	322.2	322.2	1.0000	1.0000	0.000	0.000	0.000	31.698	68.258	82.429
125.0	2.361%10	0.0459	375.4	391.3	375.4	1.0425	0.084	0.000	0.000	36.294	63.621	79.595
130.0	2.458%10	0.0478	427.2	459.1	427.2	1.0747	0.161	0.000	0.000	40.716	59.123	76.313
135.0	2.838%10	0.0552	476.6	524.5	476.6	1.1004	0.307	0.000	0.000	43.939	55.754	72.535
140.0	3.326%10	0.0647	522.1	585.9	522.1	1.1222	0.584	0.000	0.000	45.000	54.416	56.046
145.0	4.653%10	0.0905	598.5	694.1	598.5	1.1599	2.074	0.000	0.000	41.880	56.046	56.046
150.0	6.895%10	0.1341	656.6	784.2	656.6	1.1943	6.909	0.000	0.000	36.631	56.461	56.461
155.0	1.031%11	0.2006	700.7	860.2	700.7	1.2276	19.661	0.000	0.000	30.703	49.636	49.636
160.0	1.563%11	0.3040	734.9	926.3	734.9	1.2604	41.885	0.000	0.000	21.641	36.474	36.474
165.0	2.225%11	0.4329	761.9	985.5	761.9	1.2931	63.787	0.000	0.000	10.559	25.553	25.553
170.0	2.937%11	0.5713	783.7	1038.9	783.7	1.3256	76.967	0.000	0.000	4.137	18.896	18.896
175.0	3.625%11	0.7050	801.6	1088.7	801.6	1.3581	83.288	0.000	0.000	1.545	15.167	15.167
180.0	4.218%11	0.8205	816.3	1135.3	816.3	1.3899	86.496	0.000	0.000	0.573	12.931	12.931
185.0	4.670%11	0.9084	828.5	1179.4	831.8	1.4179	88.560	0.000	0.000	0.212	14.228	14.228
190.0	4.963%11	0.9653	838.6	1221.4	846.7	1.4425	90.243	0.000	0.000	0.079	9.679	9.679
195.0	5.141%11	0.9999	854.1	1300.7	876.7	1.4837	93.359	0.000	0.000	0.011	6.630	6.630
200.0	5.066%11	0.9855	864.8	1375.2	906.6	1.5169	96.398	0.000	0.000	0.001	3.600	3.600
205.0	4.871%11	0.9475	872.4	1446.5	936.5	1.5446	98.000	0.000	0.000	0.000	2.000	2.000
210.0	4.579%11	0.8906	877.7	1515.6	966.4	1.5682	98.100	0.000	0.000	0.000	1.900	1.900
215.0	4.219%11	0.8206	881.5	1583.2	996.4	1.5890	98.101	1.044	0.116	0.000	0.739	0.739
220.0	3.822%11	0.7435	884.2	1633.7	1026.3	1.5918	98.099	1.620	0.180	0.000	0.101	0.101
225.0	3.416%11	0.6645	886.2	1668.0	1056.2	1.5792	98.096	1.701	0.189	0.000	0.014	0.014
230.0	3.022%11	0.5879	887.7	1702.3	1086.2	1.5672	98.093	1.715	0.191	0.000	0.002	0.002
235.0	2.655%11	0.5175	888.9	1722.1	1116.1	1.5430	98.084	1.724	0.192	0.000	0.000	0.000
240.0	2.323%11	0.4519	889.7	1742.0	1146.1	1.5200	97.961	1.835	0.204	0.000	0.000	0.000
245.0	2.030%11	0.3949	890.4	1762.0	1176.1	1.4982	96.910	2.781	0.309	0.000	0.000	0.000
250.0	1.776%11	0.3454	890.9	1782.0	1206.0	1.4775	95.399	4.141	0.460	0.000	0.000	0.000
255.0	1.558%11	0.3031	891.3	1801.9	1236.0	1.4579	93.884	5.504	0.612	0.000	0.000	0.000
260.0	1.373%11	0.2671	891.7	1821.9	1266.0	1.4391	92.381	6.857	0.762	0.000	0.000	0.000
265.0	1.217%11	0.2368	892.7	1841.9	1296.0	1.4212	90.884	8.204	0.912	0.000	0.000	0.000
270.0	1.040%10	0.1439	892.1	1861.9	1326.0	1.4042	89.386	9.553	1.061	0.000	0.000	0.000
275.0	0.848%10	0.1332	892.8	1881.9	1356.0	1.3878	87.876	10.912	1.212	0.000	0.000	0.000
280.0	0.758%10	0.1898	893.1	1901.9	1386.0	1.3722	86.341	12.293	1.366	0.000	0.000	0.000
285.0	0.636%10	0.1241	892.5	1921.9	1416.0	1.3573	84.767	13.709	1.523	0.000	0.000	0.000
290.0	0.595%10	0.1164	892.9	1941.9	1446.0	1.3430	83.136	15.178	1.686	0.000	0.000	0.000
295.0	0.546%10	0.1098	893.0	2021.9	1565.9	1.3292	81.431	16.712	1.857	0.000	0.000	0.000
300.0	0.5358%10	0.1042	893.0	2041.8	1595.9	1.3160	79.639	18.325	2.036	0.000	0.000	0.000
305.0	0.511%10	0.0994	893.1	2061.8	1625.9	1.2934	77.020	20.224	0.000	0.000	0.000	0.000
310.0	0.4900%10	0.0953	893.1	2081.8	1655.9	1.2722	75.787	21.791	2.421	0.000	0.000	0.000
315.0	0.4718%10	0.0918	893.1	2101.8	1685.9	1.2467	67.452	29.293	3.044	0.000	0.000	0.000

WE PUT B1= 3.070 GET HST

INPUT: LATI= 44.1 LONGI= 2.0 R=100 MONTH=12 HOUR= 8.0

CALCULATED VALUES: MLAT= 46.6 MLNG= 83.1
 DIP= 59.6 MODIP= 50.8 MAGLA= 40.5 XHI= 158.8
 SUNRISE: 7:6 L.T. SUNSET: 16:4 L.T. SUN DEC. = -22.
 NMFL2= 1.88% NMFL1= 0.00% NM= 3.20% NMDF= 4.00% NMDB= 4.00%
 HME2= 3.52% HME1= 0.0 HME= 105.0 HMD= 88.0

INPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= 25.6 MLONG= 206.6
 DIP= 48.6 MUDIP= 43.3 MAGLA= 29.6 XHI= 39.0
 SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC.= -3.3
 NMF1= 2.31% HMF1= 1.24% NM= 5.69%
 HMF2= 274.6 HMF1= 198.4 HME= 110.0 HMD= 81.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDD-	RDHE+	RDHE-	RDN+	RDN-	RDO+	RDO-
80.0	5.426%08	6.9%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.123%09	0.0014	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.182%10	0.0150	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	4.818%10	0.0610	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	9.550%10	0.1209	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.206%11	0.1526	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.241%11	0.1571	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.204%11	0.1523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.191%11	0.1508	305.9	305.9	1.0000	1.266	0.000	0.000	0.000	52.200	46.534	62.409	37.384
125.0	1.242%11	0.1572	352.8	405.9	1.1505	1.979	0.000	0.000	0.000	59.949	39.725	48.899	49.121
130.0	1.246%11	0.1577	398.4	504.6	1.2665	3.076	0.000	0.000	0.000	45.063	51.860	57.512	41.975
135.0	1.251%11	0.1583	441.4	600.7	1.3608	4.736	0.000	0.000	0.000	40.984	54.281	54.994	44.199
140.0	1.258%11	0.1592	479.9	692.3	1.4425	7.175	0.000	0.000	0.000	37.000	55.825	52.200	46.534
145.0	1.281%11	0.1622	541.8	860.4	1.5879	15.113	0.000	0.000	0.000	29.918	54.969	52.200	46.534
150.0	1.323%11	0.1675	586.5	1011.3	1.7242	26.363	0.000	0.000	0.000	24.108	49.529	48.899	49.121
155.0	1.404%11	0.1777	619.1	1150.0	1.8576	36.882	0.000	0.000	0.000	19.286	43.832	40.852	40.931
160.0	1.616%11	0.2046	643.6	1280.7	1.9899	44.217	0.000	0.000	0.000	10.440	40.263	1.897	32.279
165.0	2.051%11	0.2595	662.6	1405.9	1.63	2.1197	49.297	0.000	0.000	0.000	0.000	0.000	0.000
170.0	2.462%11	0.3116	677.8	1527.3	1.682	2.2379	53.471	0.000	0.000	0.000	0.000	0.000	0.000
175.0	3.539%11	0.4479	586.5	1011.3	1.7242	26.363	0.000	0.000	0.000	24.108	49.529	48.899	49.121
180.0	4.685%11	0.5930	700.1	1627.5	2.2577	61.526	0.000	0.000	0.000	2.920	35.554	40.852	40.931
185.0	5.771%11	0.7303	708.5	1652.9	2.2335	65.824	0.000	0.000	0.000	1.897	32.279	1.897	32.279
190.0	6.679%11	0.8453	715.3	1659.6	2.1860	70.397	0.000	0.000	0.000	1.232	28.371	0.000	0.000
195.0	7.727%11	0.9780	725.8	1628.6	2.0419	80.490	0.000	0.000	0.000	0.000	0.000	0.000	0.000
200.0	7.886%11	0.9981	733.0	1572.7	836.0	1.8813	91.650	0.000	0.000	0.000	0.000	0.000	0.000
205.0	7.591%11	0.9607	738.1	1526.9	874.4	1.7463	98.000	0.000	0.000	0.000	0.000	0.000	0.000
210.0	6.983%11	0.8838	741.7	1504.9	912.8	1.6487	98.409	0.000	0.000	0.000	0.000	0.000	0.000
215.0	6.177%11	0.7818	744.2	1505.2	951.3	1.5823	98.416	0.000	0.000	0.000	0.000	0.000	0.000
220.0	5.292%11	0.698	746.1	1521.4	990.1	1.5367	98.414	0.000	0.000	0.000	0.000	0.000	0.000
225.0	4.423%11	0.598	747.5	1547.6	1029.5	1.5033	98.411	0.000	0.000	0.000	0.000	0.000	0.000
230.0	3.634%11	0.460	748.5	1579.9	1070.5	1.4759	98.408	0.000	0.000	0.000	0.000	0.000	0.000
235.0	2.956%11	0.3742	749.2	1615.3	1114.6	1.4492	98.399	0.000	0.000	0.000	0.000	0.000	0.000
240.0	2.396%11	0.3033	749.8	1652.7	1163.6	1.4203	98.276	1.535	0.000	0.000	0.000	0.000	0.000
245.0	1.946%11	0.2462	750.3	1691.2	1217.5	1.3891	97.221	2.494	0.000	0.000	0.000	0.000	0.000
250.0	1.590%11	0.2012	750.6	1730.3	1274.5	1.3576	95.705	3.863	0.000	0.000	0.000	0.000	0.000
255.0	1.311%11	0.1659	750.9	1769.6	1333.1	1.3274	94.186	5.232	0.000	0.000	0.000	0.000	0.000
260.0	1.095%11	0.1385	751.1	1809.2	1392.4	1.2993	92.678	6.589	0.000	0.000	0.000	0.000	0.000
265.0	9.261%10	0.1172	751.3	1848.8	1451.9	1.1878	85.039	13.465	0.000	0.000	0.000	0.000	0.000
270.0	7.948%10	0.1006	751.4	1888.5	1511.5	1.2495	91.274	7.941	0.000	0.000	0.000	0.000	0.000
275.0	6.920%10	0.0876	751.6	1928.3	1571.1	1.2273	89.673	9.295	0.000	0.000	0.000	0.000	0.000
280.0	6.110%10	0.0773	751.7	1968.0	1630.7	1.2068	86.619	10.658	0.000	0.000	0.000	0.000	0.000
285.0	5.468%10	0.0692	751.7	2027.8	1690.3	1.1878	91.176	7.941	0.000	0.000	0.000	0.000	0.000
290.0	4.956%10	0.0627	751.8	2047.5	1749.9	1.1701	83.403	14.937	0.000	0.000	0.000	0.000	0.000
295.0	4.544%10	0.0575	751.9	2087.3	1809.5	1.1535	81.692	11.033	0.000	0.000	0.000	0.000	0.000
300.0	4.211%10	0.0533	751.9	2127.1	1869.5	1.1380	88.158	16.477	1.831	0.000	0.000	0.000	0.000
305.0	3.940%10	0.0499	752.0	2166.8	1928.5	1.1236	86.195	18.795	2.011	0.000	0.000	0.000	0.000
310.0	3.719%10	0.0471	752.0	2206.6	1987.9	1.1100	76.031	21.572	2.397	0.000	0.000	0.000	0.000
315.0	3.536%10	0.0448	752.0	2246.4	2047.2	1.0973	73.986	23.412	2.601	0.000	0.000	0.000	0.000
320.0	3.386%10	0.0429	752.1	2286.1	2106.3	1.0854	71.895	25.295	2.811	0.000	0.000	0.000	0.000
325.0	3.261%10	0.0413	752.1	2325.9	2165.2	1.0742	69.781	27.197	3.022	0.000	0.000	0.000	0.000
330.0	3.157%10	0.0399	752.1	2365.7	2223.7	1.0638	67.669	3.233	0.000	0.000	0.000	0.000	0.000

WE PUT Bl= 3.0TU GET HST

INPUT: LATI= 140.0 LONGI= 35.7 MONTH= 10 R= 10 HOUR= 6.2

CALCULATED VALUES: NLAT= 25.6 MLAT= 206.6 XHI= 90.0
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 SUN DEC.= -3.3
 SUNRISE: 6:2 L.T. SUNSET: 17:8 L.T.
 NMFL2= 1.72% NMFL1= 0.00%-01 TIME: 3.10%10 NMD= 4.00%08
 HME= 107.5 HMD= 84.5

TNPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHI= 147.6
 SUNRISE: 6:2 L.T. SUNSET:17:8 L.T. SUN DEC.: -3.3
 NMF2=1.64%11 NMFL1= 0.00%-01 NME=1.78%09 NMHD=4.00%08
 HMF2=337.8 HMFL1= 0.0 HME=105.0 HMHD= 88.0

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDO+	RDHE+	RDH+	RDO2+	RDO+
80.0	5.417%05	3.3%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.474%08	0.0015	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.729%08	0.0029	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0106	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0108	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.451%09	0.0088	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	9.462%08	0.0058	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	6.022%08	0.0037	286.1	286.1	1.00000	0.115	0.000	0.000	0.000	17.950	82.030
120.0	1.775%09	0.0108	-1	-1	-1	-1	-1	-1	-1	-1	-1
125.0	4.238%08	0.0026	325.5	331.4	1.0182	0.178	0.000	0.000	0.000	20.889	79.081
130.0	3.505%08	0.0021	363.6	375.4	1.0326	0.275	0.000	0.000	0.000	24.232	75.721
135.0	3.447%08	0.0021	398.8	416.5	1.0445	0.425	0.000	0.000	0.000	27.887	72.039
140.0	3.936%08	0.0024	429.3	453.0	1.0552	0.655	0.000	0.000	0.000	31.524	68.361
150.0	6.643%08	0.0040	475.7	511.2	1.0747	1.526	0.000	0.000	0.000	34.509	65.313
160.0	1.161%09	0.0071	507.2	554.6	1.0934	3.349	0.000	0.000	0.000	36.301	63.424
170.0	1.879%09	0.0114	529.2	588.4	1.1119	6.470	0.000	0.000	0.000	36.979	62.596
180.0	2.425%09	0.0148	545.3	616.4	1.1300	10.420	0.000	0.000	0.000	37.000	62.345
190.0	3.154%09	0.0192	557.6	640.5	1.1430	14.368	0.000	0.000	0.000	36.335	62.139
200.0	4.161%09	0.0252	567.3	662.0	1.1508	18.218	0.000	0.000	0.000	35.403	61.248
210.0	5.509%09	0.0336	575.1	681.6	1.1549	22.327	0.000	0.000	0.000	10.039	59.510
220.0	7.469%09	0.0455	581.4	699.8	1.1565	27.036	0.000	0.000	0.000	6.526	66.438
230.0	1.043%10	0.0635	586.6	716.9	1.1562	32.605	0.000	0.000	0.000	4.240	63.155
240.0	1.539%10	0.0938	590.9	733.0	1.1544	39.266	0.000	0.000	0.000	2.755	57.979
260.0	4.301%10	0.2620	597.5	763.2	1.1508	56.879	0.000	0.000	0.000	1.163	41.958
280.0	8.823%10	0.5374	602.0	791.4	1.1549	81.441	0.000	0.000	0.000	0.491	18.069
300.0	1.325%11	0.8074	605.1	818.3	1.1295	98.000	0.000	0.000	0.000	0.207	1.793
320.0	1.584%11	0.9650	607.4	844.2	1.1193	99.107	0.000	0.000	0.000	0.087	0.806
340.0	1.641%11	0.9997	609.0	869.4	1.1092	99.085	0.395	0.044	0.037	0.438	0.185
360.0	1.599%11	0.9738	610.1	894.3	813.1	1.0998	99.020	0.701	0.078	0.016	0.078
380.0	1.497%11	0.9120	610.9	918.8	841.5	1.0919	98.914	0.901	0.100	0.007	0.078
400.0	1.356%11	0.8259	611.6	943.1	867.7	1.0869	98.352	1.451	0.161	0.003	0.033
420.0	1.195%11	0.7281	612.0	943.2	889.4	1.0604	94.980	4.504	0.500	0.001	0.014
440.0	1.033%11	0.6292	612.4	943.2	904.4	1.0430	90.538	8.510	0.946	0.000	0.006
460.0	8.811%10	0.5367	612.7	943.3	912.6	1.0337	86.145	12.467	1.385	0.000	0.002
480.0	7.466%10	0.4548	612.9	943.4	916.4	1.0295	81.802	16.378	1.820	0.000	0.001
500.0	6.320%10	0.3850	613.1	943.5	918.0	1.0278	77.467	20.279	2.253	0.000	0.000
520.0	5.369%10	0.3270	613.2	943.6	918.6	1.0271	73.102	24.208	2.690	0.000	0.000
540.0	4.593%10	0.2798	613.3	943.7	919.0	1.0269	68.675	28.192	3.132	0.000	0.000
560.0	3.968%10	0.2417	613.4	943.7	919.2	1.0267	64.178	32.239	3.582	0.000	0.000
580.0	3.466%10	0.2112	613.5	943.8	919.3	1.0266	59.629	36.333	4.037	0.000	0.000
600.0	3.065%10	0.1867	613.6	943.9	919.5	1.0266	55.077	40.431	4.492	0.000	0.000
620.0	2.744%10	0.1671	613.6	944.0	919.6	1.0265	50.589	44.470	4.941	0.000	0.000
640.0	2.486%10	0.1514	613.7	944.1	919.7	1.0265	46.240	48.384	5.376	0.000	0.000
660.0	2.278%10	0.1388	613.7	944.2	919.9	1.0264	42.097	52.113	5.790	0.000	0.000
680.0	2.110%10	0.1285	613.7	944.2	920.0	1.0264	38.204	55.616	6.180	0.000	0.000
700.0	1.974%10	0.1202	613.8	944.3	920.1	1.0263	34.592	58.868	6.541	0.000	0.000
720.0	1.862%10	0.1134	613.8	944.4	920.2	1.0263	31.268	61.859	6.873	0.000	0.000
740.0	1.771%10	0.1079	613.8	944.5	920.4	1.0262	28.230	64.593	7.177	0.000	0.000
760.0	1.696%10	0.1033	613.8	944.6	920.5	1.0262	25.466	67.081	7.453	0.000	0.000
780.0	1.635%10	0.0996	613.8	944.7	920.6	1.0261	22.959	69.337	7.704	0.000	0.000
800.0	1.584%10	0.0965	613.8	944.7	920.7	1.0261	20.691	71.378	7.931	0.000	0.000

WE PUT B1= 3.0 TO GET HST

INPUII: 1 ATI= 355.7 LONGI= 140.0 R= 10 MONTH= 6 HOUR=12.0

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHI= 12.6
 SUNRISE: 4:8 L.T. SUNSET: 19:2 L.T. SUN DEC.= 23.1
 NMFC2= 3.96% HMF1= 2.51% HME1= 3.88% NMD= 6.23%08
 HMF2= 2.55% HMF1= 195.7 HME= 110.0 HMD= 81.0

	RDN0+	RDD2+	RDH+	RDHE+	TE/TI	TI	TE	TN	N/NMAX
H	NE				-1	-1	-1	-1	0.0015
10.0	5.952%	0.8			-1	-1	-1	-1	0.0031
15.0	1.246%	0.9			-1	-1	-1	-1	0.0331
20.0	1.311%	1.0			-1	-1	-1	-1	0.1346
25.0	5.335%	1.0			-1	-1	-1	-1	0.2670
30.0	1.058%	1.1			-1	-1	-1	-1	0.3375
35.0	1.338%	1.1			-1	-1	-1	-1	0.3477
40.0	1.378%	1.1			-1	-1	-1	-1	0.3477
45.0	1.341%	1.1			-1	-1	-1	-1	0.3384
50.0	1.328%	1.1			-1	-1	-1	-1	0.3351
55.0	1.382%	1.1			-1	-1	-1	-1	0.3489
60.0	1.412%	1.1			-1	-1	-1	-1	0.3564
65.0	1.412%	1.1			-1	-1	-1	-1	0.3564
70.0	1.787%	1.1			-1	-1	-1	-1	0.4509
75.0	1.388%	1.1			-1	-1	-1	-1	0.7919
80.0	3.486%	1.1			-1	-1	-1	-1	0.8798
85.0	3.736%	1.1			-1	-1	-1	-1	0.9428
90.0	3.887%	1.1			-1	-1	-1	-1	0.9809
95.0	3.959%	1.1			-1	-1	-1	-1	0.9910
100.0	3.839%	1.1			-1	-1	-1	-1	0.9689
105.0	3.578%	1.1			-1	-1	-1	-1	0.9028
110.0	3.220%	1.1			-1	-1	-1	-1	0.8125
115.0	2.815%	1.1			-1	-1	-1	-1	0.7103
120.0	2.405%	1.1			-1	-1	-1	-1	0.6070
125.0	2.022%	1.1			-1	-1	-1	-1	0.5103
130.0	1.683%	1.1			-1	-1	-1	-1	0.4247
135.0	1.394%	1.1			-1	-1	-1	-1	0.3518
140.0	1.155%	1.1			-1	-1	-1	-1	0.2915
145.0	9.609%	1.0			-1	-1	-1	-1	0.2425
150.0	8.054%	1.0			-1	-1	-1	-1	0.2032
155.0	6.815%	1.0			-1	-1	-1	-1	0.1720
160.0	5.832%	1.0			-1	-1	-1	-1	0.1472
165.0	4.536%	1.0			-1	-1	-1	-1	0.0892
170.0	3.214%	1.0			-1	-1	-1	-1	0.0811
175.0	4.000%	1.0			-1	-1	-1	-1	0.0745
180.0	2.421%	1.0			-1	-1	-1	-1	0.0611
185.0	2.302%	1.0			-1	-1	-1	-1	0.0581
190.0	2.203%	1.0			-1	-1	-1	-1	0.0556
195.0	2.120%	1.0			-1	-1	-1	-1	0.0535
200.0	2.051%	1.0			-1	-1	-1	-1	0.0507
205.0	1.980%	1.0			-1	-1	-1	-1	0.0500
210.0	1.921%	1.0			-1	-1	-1	-1	0.0500
215.0	1.872%	1.0			-1	-1	-1	-1	0.0500
220.0	1.821%	1.0			-1	-1	-1	-1	0.0500
225.0	1.772%	1.0			-1	-1	-1	-1	0.0500
230.0	1.723%	1.0			-1	-1	-1	-1	0.0500
235.0	1.673%	1.0			-1	-1	-1	-1	0.0500
240.0	1.623%	1.0			-1	-1	-1	-1	0.0500
245.0	1.573%	1.0			-1	-1	-1	-1	0.0500
250.0	1.523%	1.0			-1	-1	-1	-1	0.0500
255.0	1.473%	1.0			-1	-1	-1	-1	0.0500
260.0	1.423%	1.0			-1	-1	-1	-1	0.0500
265.0	1.373%	1.0			-1	-1	-1	-1	0.0500
270.0	1.323%	1.0			-1	-1	-1	-1	0.0500
275.0	1.273%	1.0			-1	-1	-1	-1	0.0500
280.0	1.223%	1.0			-1	-1	-1	-1	0.0500
285.0	1.173%	1.0			-1	-1	-1	-1	0.0500
290.0	1.123%	1.0			-1	-1	-1	-1	0.0500
295.0	1.073%	1.0			-1	-1	-1	-1	0.0500
300.0	1.023%	1.0			-1	-1	-1	-1	0.0500
305.0	9.723%	1.0			-1	-1	-1	-1	0.0500
310.0	9.223%	1.0			-1	-1	-1	-1	0.0500
315.0	8.723%	1.0			-1	-1	-1	-1	0.0500
320.0	8.223%	1.0			-1	-1	-1	-1	0.0500
325.0	7.723%	1.0			-1	-1	-1	-1	0.0500
330.0	7.223%	1.0			-1	-1	-1	-1	0.0500
335.0	6.723%	1.0			-1	-1	-1	-1	0.0500
340.0	6.223%	1.0			-1	-1	-1	-1	0.0500
345.0	5.723%	1.0			-1	-1	-1	-1	0.0500
350.0	5.223%	1.0			-1	-1	-1	-1	0.0500
355.0	4.723%	1.0			-1	-1	-1	-1	0.0500
360.0	4.223%	1.0			-1	-1	-1	-1	0.0500
365.0	3.723%	1.0			-1	-1	-1	-1	0.0500
370.0	3.223%	1.0			-1	-1	-1	-1	0.0500
375.0	2.723%	1.0			-1	-1	-1	-1	0.0500
380.0	2.223%	1.0			-1	-1	-1	-1	0.0500
385.0	1.723%	1.0			-1	-1	-1	-1	0.0500
390.0	1.223%	1.0			-1	-1	-1	-1	0.0500
395.0	0.723%	1.0			-1	-1	-1	-1	0.0500
400.0	0.223%	1.0			-1	-1	-1	-1	0.0500
405.0	-0.323%	1.0			-1	-1	-1	-1	0.0500
410.0	-0.823%	1.0			-1	-1	-1	-1	0.0500
415.0	-1.323%	1.0			-1	-1	-1	-1	0.0500
420.0	-1.823%	1.0			-1	-1	-1	-1	0.0500
425.0	-2.323%	1.0			-1	-1	-1	-1	0.0500
430.0	-2.823%	1.0			-1	-1	-1	-1	0.0500
435.0	-3.323%	1.0			-1	-1	-1	-1	0.0500
440.0	-3.823%	1.0			-1	-1	-1	-1	0.0500
445.0	-4.323%	1.0			-1	-1	-1	-1	0.0500
450.0	-4.823%	1.0			-1	-1	-1	-1	0.0500
455.0	-5.323%	1.0			-1	-1	-1	-1	0.0500
460.0	-5.823%	1.0			-1	-1	-1	-1	0.0500
465.0	-6.323%	1.0			-1	-1	-1	-1	0.0500
470.0	-6.823%	1.0			-1	-1	-1	-1	0.0500
475.0	-7.323%	1.0			-1	-1	-1	-1	0.0500
480.0	-7.823%	1.0			-1	-1	-1	-1	0.0500
485.0	-8.323%	1.0			-1	-1	-1	-1	0.0500
490.0	-8.823%	1.0			-1	-1	-1	-1	0.0500
495.0	-9.323%	1.0			-1	-1	-1	-1	0.0500
500.0	-9.823%	1.0			-1	-1	-1	-1	0.0500
505.0	-10.323%	1.0			-1	-1	-1	-1	0.0500
510.0	-10.823%	1.0			-1	-1	-1	-1	0.0500
515.0	-11.323%	1.0			-1	-1	-1	-1	0.0500
520.0	-11.823%	1.0			-1	-1	-1	-1	0.0500
525.0	-12.323%	1.0			-1	-1	-1	-1	0.0500
530.0	-12.823%	1.0			-1	-1	-1	-1	0.0500
535.0	-13.323%	1.0			-1	-1	-1	-1	0.0500
540.0	-13.823%	1.0			-1	-1	-1	-1	0.0500
545.0	-14.323%	1.0			-1	-1	-1	-1	0.0500
550.0	-14.823%	1.0			-1	-1	-1	-1	0.0500
555.0	-15.323%	1.0			-1	-1	-1	-1	0.0500
560.0	-15.823%	1.0			-1	-1	-1	-1	0.0500
565.0	-16.323%	1.0			-1	-1	-1	-1	0.0500
570.0	-16.823%	1.0			-1	-1	-1	-1	0.0500
575.0	-17.323%	1.0			-1	-1	-1	-1	0.0500
580.0	-17.823%	1.0			-1	-1	-1	-1	0.0500
585.0	-18.323%	1.0			-1	-1	-1	-1	0.0500
590.0	-18.823%	1.0			-1	-1	-1	-1	0.0500
595.0	-19.323%	1.0			-1	-1	-1	-1	0.0500
600.0	-19.823%	1.0			-1	-1	-1	-1	0.0500
605.0	-20.323%	1.0			-1	-1	-1	-1	0.0500
610.0	-20.823%	1.0			-1	-1	-1	-1	0.0500
615.0	-21.323%	1.0			-1	-1	-1	-1	0.0500
620.0	-21.823%	1.0			-1	-1	-1	-1	0.0500
625.0	-22.323%	1.0			-1	-1	-1	-1	0.0500
630.0	-22.823%	1.0			-1	-1	-1	-1	0.0500
635.0	-23.323%	1.0			-1	-1	-1	-1	0.0500
640.0	-23.823%	1.0			-1	-1	-1	-1	0.0500
645.0	-24.323%	1.0			-1	-1	-1	-1	0.0500
650.0	-24.823%	1.0			-1	-1	-1	-1	0.0500
655.0	-25.323%	1.0			-1	-1	-1	-1	0.0500
660.0	-25.823%	1.0			-1	-1	-1	-1	0.0500
665.0	-26.323%	1.0			-1	-1	-1	-1	0.0500
670.0	-26.823%	1.0			-1	-1	-1	-1	0.0500
675.0	-27.323%	1.0			-1	-1	-1	-1	0.0500
680.0	-27.823%	1.0			-1	-1	-1	-1	0.0500
685.0	-28.323%	1.0			-1	-1	-1	-1	0.0500
690.0	-28.823%	1.0			-1	-1	-1	-1	0.0500
695.0	-29.323%	1.0			-1	-1	-1	-1	0.0500
700.0	-29.823%	1.0			-1	-1	-1	-1	0.0500
705.0	-30.323%	1.0			-1	-1	-1	-1	0.0500
710.0	-30.823%	1.0			-1	-1	-1	-1	0.0500
715.0	-31.323%	1.0			-1	-1	-1	-1	0.0500
720.0	-31.823%	1.0			-1	-1	-1	-1	0.0500
725.0	-32.323%	1.0			-1	-1	-1	-1	0.0500
730.0	-32.823%	1.0			-1	-1	-1	-1	0.0500
735.0	-33.323%	1.0			-1	-1	-1	-1	0.0500
740.0	-33.823%	1.0			-1	-1	-1	-1	0.0500
745.0	-34.323%	1.0			-1	-1	-1	-1	0.0500
750.0	-34.823%	1.0			-1	-1	-1	-1	0.0500
755.0	-35.323%	1.0			-1	-1	-1	-1	0.0500
760.0	-35.823%	1.0			-1	-1	-1	-1	0.0500
765.0	-36.323%	1.0			-1	-1	-1	-1	0.0500
770.0	-36.823%	1.0			-1	-1	-1	-1	0.0500
775.0	-37.323%	1.0			-1	-1	-1	-1	0.0500
780.0	-37.823%	1.0			-1	-1	-1	-1	0.0500
785.0	-38.323%	1.0			-1	-1	-1	-1	0.0500
790.0	-38.823%	1.0			-1	-1	-1	-1	0.0500
795.0	-39.323%	1.0			-1	-1	-1	-1	0.0500
800.0	-39.823%	1.0			-1	-1	-1	-1	0.0

INPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH= 6 H1UR= 4.8

CALCULATED VALUES:
 DIP= 48.6 HGDIP= 43.3 NAGLA= 29.6 XHI= 90.0
 SUMRISE: 4.8 L.T. SUNSET: 19.2 L.T. SUN DEC.= 23.1
 NMF2=1.83%11 HMFI= 0.00%-01 NMME=3.00%10 HMD=4.00%08
 HMFI=269.0 HMFI= 0.0 HME=107.5 HMD= 84.5

H	HE	N/HMAX	TN	TE	T1	TE/T1	RDD+	RDH+	RDHE+	RDD2+	RDN0+
30.0	2.833%08	0.0015	-1	-1	-1	-1	-1	-1	-1	-1	-1
35.0	4.098%08	0.0022	-1	-1	-1	-1	-1	-1	-1	-1	-1
40.0	1.815%09	0.0099	-1	-1	-1	-1	-1	-1	-1	-1	-1
45.0	1.144%10	0.0624	-1	-1	-1	-1	-1	-1	-1	-1	-1
50.0	2.481%10	0.1353	-1	-1	-1	-1	-1	-1	-1	-1	-1
55.0	2.984%10	0.1628	-1	-1	-1	-1	-1	-1	-1	-1	-1
60.0	2.903%10	0.1584	-1	-1	-1	-1	-1	-1	-1	-1	-1
65.0	2.399%10	0.1309	-1	-1	-1	-1	-1	-1	-1	-1	-1
70.0	1.926%10	0.1051	291.7	291.7	1.0000	0.016	0.000	0.000	0.000	5.910	94.089
75.0	1.729%10	0.0944	333.2	364.9	1.0952	0.031	0.000	0.000	0.000	7.935	92.062
80.0	1.827%10	0.0997	373.5	436.9	1.1699	0.059	0.000	0.000	0.000	10.632	89.364
85.0	2.119%10	0.1156	410.8	506.0	1.2317	0.111	0.000	0.000	0.000	14.159	85.833
90.0	2.484%10	0.1355	443.5	570.4	1.2861	0.210	0.000	0.000	0.000	32.271	81.412
95.0	2.220%10	0.1757	494.1	684.5	1.3852	0.704	0.000	0.000	0.000	23.544	76.425
100.0	3.691%10	0.2014	529.0	782.8	1.4798	2.040	0.000	0.000	0.000	28.077	71.864
105.0	4.291%10	0.2341	553.6	870.9	1.5730	4.568	0.000	0.000	0.000	31.036	68.853
110.0	5.123%10	0.2795	571.8	952.5	1.6642	7.728	0.000	0.000	0.000	32.271	67.520
115.0	6.623%10	0.3613	585.8	1029.9	1.7446	10.889	0.000	0.000	0.000	26.569	62.541
120.0	8.941%10	0.4878	596.8	1104.3	1.8155	14.130	0.000	0.000	0.000	32.099	67.197
125.0	1.132%11	0.6178	605.6	1142.7	1.8247	17.781	0.000	0.000	0.000	31.000	66.960
130.0	1.355%11	0.7393	612.9	1173.2	1.8212	22.141	0.000	0.000	0.000	29.795	65.637
135.0	1.543%11	0.8419	618.8	1194.3	1.8036	27.474	0.000	0.000	0.000	28.508	63.764
140.0	1.685%11	0.9191	623.7	1205.4	1.7724	34.052	0.000	0.000	0.000	6.709	65.816
145.0	1.822%11	0.9940	631.2	1204.1	1.6817	52.250	0.000	0.000	0.000	4.360	61.588
150.0	1.822%11	0.9939	636.4	1189.3	1.5816	79.114	0.000	0.000	0.000	1.840	45.910
155.0	1.749%11	0.9541	640.0	1178.7	1.4961	98.000	0.000	0.000	0.000	0.777	20.109
160.0	1.622%11	0.8847	642.5	1179.7	1.4320	99.313	0.000	0.000	0.000	0.328	1.672
165.0	1.460%11	0.7964	644.3	1191.4	1.3860	99.338	0.000	0.000	0.000	0.138	0.548
170.0	1.283%11	0.6997	645.6	1210.9	1.3523	99.337	0.037	0.025	0.025	0.058	0.603
175.0	1.107%11	0.6037	646.6	1235.4	931.1	1.3268	99.334	0.486	0.054	0.010	0.273
180.0	9.429%10	0.5145	647.3	1262.7	966.3	1.3067	99.330	0.555	0.062	0.004	0.115
185.0	7.978%10	0.4353	647.9	1280.5	1.000.6	1.2798	99.322	0.590	0.066	0.002	0.021
190.0	6.736%10	0.3675	648.3	1299.3	1033.5	1.2572	99.197	0.714	0.079	0.001	0.009
195.0	5.697%10	0.3108	648.6	1318.7	1065.1	1.2380	98.133	1.677	0.186	0.000	0.004
200.0	4.844%10	0.2643	648.9	1338.3	1095.9	1.2212	96.602	3.056	0.340	0.000	0.002
205.0	4.151%10	0.2265	649.1	1358.1	1126.2	1.2060	95.069	4.437	0.493	0.000	0.001
210.0	3.590%10	0.1959	649.2	1378.0	1156.3	1.1918	93.547	5.807	0.645	0.000	0.000
215.0	2.049%10	0.1118	649.7	1477.9	1306.3	1.1784	92.031	7.797	0.000	0.000	0.000
220.0	3.139%10	0.1712	649.3	1397.9	1186.3	1.1209	84.185	14.233	1.581	0.000	0.000
225.0	2.775%10	0.1514	649.5	1417.9	1216.3	1.1657	90.514	8.538	0.949	0.000	0.000
230.0	2.481%10	0.1354	649.5	1437.9	1246.3	1.1537	88.985	15.788	1.754	0.000	0.000
235.0	2.243%10	0.1224	649.6	1457.9	1276.3	1.1423	87.431	9.914	1.102	0.000	0.000
240.0	2.049%10	0.1118	649.7	1477.9	1306.3	1.1313	85.837	12.747	1.416	0.000	0.000
245.0	1.891%10	0.1032	649.7	1497.9	1336.3	1.1209	84.185	14.233	1.581	0.000	0.000
250.0	1.762%10	0.0961	649.8	1517.9	1366.2	1.1110	82.458	15.788	1.754	0.000	0.000
255.0	1.655%10	0.0903	649.8	1537.9	1396.2	1.1015	80.644	17.421	1.936	0.000	0.000
260.0	1.566%10	0.0855	649.8	1557.9	1426.3	1.0924	78.737	19.137	2.126	0.000	0.000
265.0	1.493%10	0.0815	649.9	1577.9	1456.0	1.0837	76.744	20.931	2.326	0.000	0.000
270.0	1.432%10	0.0781	649.9	1597.9	1485.9	1.0753	74.680	22.788	2.532	0.000	0.000
275.0	1.381%10	0.0753	649.9	1617.9	1515.7	1.0674	72.569	24.688	2.743	0.000	0.000
280.0	1.338%10	0.0730	649.9	1637.9	1545.4	1.0598	70.436	26.608	2.956	0.000	0.000
285.0	1.301%10	0.0710	649.9	1657.9	1574.9	1.0526	68.303	28.527	3.170	0.000	0.000

WE PUT S1= 3.0TD GET HST

INPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHII= 121.2
 SUNRISE: 4.8 L.T. SUNSET: 19.2 L.T. SUN DEC.= 23.1
 NMF1= 2.89% NMF1= 0.00%-01 NME= 1.78% NMD= 4.00% 08
 HMF2= 336.9 HMF1= 0.0 HME= 105.0 HMD= 87.9

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDH+	RDE+	RDD2+	RDN0+
80.0	7.429%05	2.6%6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.541%08	8.8%4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.759%08	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.744%09	0.0060	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0061	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.775%09	0.0061	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.456%09	0.0050	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	9.537%08	0.0033	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	6.099%08	0.0021	290.4	290.4	1.0000	0.000	0.000	0.000	0.000	23.546	76.424
125.0	4.313%08	0.0015	331.4	331.4	1.0166	0.031	0.000	0.000	0.000	28.079	71.862
130.0	3.582%08	0.0012	371.2	382.2	1.0296	0.059	0.000	0.000	0.000	31.037	68.851
135.0	3.534%08	0.0012	408.0	424.5	1.0404	0.111	0.000	0.000	0.000	32.272	67.518
140.0	4.040%08	0.0014	440.2	462.2	1.0500	0.210	0.000	0.000	0.000	32.100	67.195
145.0	6.799%08	0.0024	489.8	522.8	1.0674	0.705	0.000	0.000	0.000	31.000	66.958
150.0	6.495%09	0.0225	523.9	567.9	1.0840	2.042	0.000	0.000	0.000	29.785	65.644
160.0	1.180%09	0.0041	547.9	567.9	1.1004	4.570	0.000	0.000	0.000	28.432	63.835
170.0	2.036%09	0.0070	602.9	602.9	1.1167	7.732	0.000	0.000	0.000	26.086	63.018
180.0	2.971%09	0.0103	631.6	631.6	1.1314	10.895	0.000	0.000	0.000	32.100	67.195
190.0	4.370%09	0.0151	579.2	656.2	1.1410	14.137	0.000	0.000	0.000	20.207	65.657
200.0	6.495%09	0.0225	589.8	677.9	1.1467	17.790	0.000	0.000	0.000	12.192	70.018
210.0	9.800%09	0.0339	598.4	697.5	1.1604	22.152	0.000	0.000	0.000	6.630	71.218
220.0	1.514%10	0.0523	605.5	715.5	1.1495	27.487	0.000	0.000	0.000	3.537	68.976
230.0	2.436%10	0.0842	611.2	732.2	1.1503	34.066	0.000	0.000	0.000	1.882	64.051
240.0	4.188%10	0.1448	616.0	748.0	1.1496	52.267	0.000	0.000	0.000	0.533	47.201
250.0	1.777%11	0.3486	623.2	777.3	1.1447	52.267	0.000	0.000	0.000	0.151	20.720
260.0	2.008%11	0.6146	628.2	804.3	1.1371	79.130	0.000	0.000	0.000	0.043	1.957
270.0	2.450%11	0.8470	631.7	829.8	1.1281	98.000	0.000	0.000	0.000	0.012	0.703
280.0	2.816%11	0.9739	634.2	854.2	1.1184	99.285	0.000	0.000	0.000	0.003	0.280
290.0	2.890%11	0.9994	636.0	878.0	1.1087	99.266	0.000	0.000	0.000	0.079	0.079
300.0	2.450%11	0.9696	637.2	901.3	1.0996	99.201	0.647	0.072	0.001	0.000	0.000
310.0	2.804%11	0.9017	638.2	924.2	1.0917	99.095	0.794	0.088	0.000	0.000	0.000
320.0	2.608%11	0.8089	638.9	946.9	1.0865	98.531	1.316	0.146	0.000	0.000	0.000
330.0	2.339%11	0.8089	639.4	947.2	1.0616	95.154	4.360	0.484	0.000	0.000	0.000
340.0	2.890%11	0.9994	639.0	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
350.0	2.804%11	0.9696	639.8	949.1	1.0293	86.302	12.328	1.370	0.000	0.000	0.000
360.0	2.804%11	0.9696	640.1	947.8	1.0362	81.951	16.244	1.805	0.000	0.000	0.000
370.0	1.465%11	0.5064	640.4	948.1	1.0322	81.951	20.152	2.239	0.000	0.000	0.000
380.0	1.224%11	0.4234	640.4	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
390.0	1.023%11	0.3537	640.6	948.8	1.0286	73.235	24.088	2.676	0.000	0.000	0.000
400.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
410.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
420.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
430.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
440.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
450.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
460.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
470.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
480.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
490.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
500.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
510.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
520.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
530.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
540.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
550.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
560.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
570.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
580.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
590.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
600.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
610.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
620.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
630.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
640.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
650.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
660.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
670.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
680.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
690.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
700.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
710.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
720.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
730.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
740.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
750.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
760.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
770.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
780.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
790.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000
800.0	1.224%11	0.4234	640.4	948.1	1.0288	81.951	16.244	1.805	0.000	0.000	0.000
810.0	1.023%11	0.3537	640.6	948.5	1.0305	77.609	55.177	4.482	0.000	0.000	0.000
820.0	2.039%11	0.7051	639.4	947.2	1.0297	73.235	24.088	2.676	0.000	0.000	0.000
830.0	1.740%11	0.6017	639.8	947.5	1.0451	90.703	8.367	0.930	0.000	0.000	0.000
840.0	8.581%10	0.2967	640.7	948.8	1.0284	68.801	28.079	3.120	0.000	0.000	0.000
850.0	1.725%10	0.2509	640.8	949.1	1.0284	86.302	12.328	1.34	0.000	0.000	0.000
860.0	1.465%11	0.5064	640.1	949.4	1.0290	64.296	64.296	3.570	0.000	0.000	0.000

INPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH=12 HOUR=12

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHI= 58.6
 SUNRISE: 7:2 L.T. SUNSET: 16:8 L.T. SUN DEC. = -22.9
 NMF2=5.38%11 NMFI= 0.00%-01 NMEE=1.03%11 NMD=3.87%08
 HMF2=229.2 HMF1= 0.0 HME=109.9 HMD= 81.1

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDHE+	RDN+	RDD2+	RDHE2+	RDN2+
80.0	3.681%08	6.8%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	7.420%08	0.0014	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	8.042%09	0.0150	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	3.540%10	0.0658	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	7.551%10	0.1404	-1	-1	-1	-1	-1	0.298	0.000	0.000	44.586	55.116
105.0	9.956%10	0.1852	-1	-1	-1	-1	-1	0.445	0.000	0.000	45.596	53.960
110.0	1.034%11	0.1924	-1	-1	-1	-1	-1	0.664	0.000	0.000	46.605	52.731
115.0	9.743%10	0.1812	-1	-1	-1	-1	-1	0.994	0.000	0.000	47.573	51.436
120.0	9.478%10	0.1763	302.9	302.9	1.0000	1.479	0.000	0.000	0.000	0.000	48.395	50.126
125.0	1.060%11	0.1971	348.6	402.3	348.6	1.1540	2.205	0.000	0.000	0.000	48.838	48.957
130.0	1.105%11	0.2055	393.1	500.4	393.1	1.2731	3.283	0.000	0.000	0.000	48.527	48.190
135.0	1.154%11	0.2146	434.8	595.8	434.8	1.3703	4.876	0.000	0.000	0.000	47.193	47.931
140.0	1.207%11	0.2245	472.1	686.7	472.1	1.4548	7.210	0.000	0.000	0.000	45.000	47.790
150.0	1.330%11	0.2474	531.5	853.5	531.5	1.6059	15.364	0.000	0.000	0.000	39.522	45.116
160.0	1.487%11	0.2766	573.9	1003.3	573.9	1.7482	30.265	0.000	0.000	0.000	32.942	36.793
170.0	1.717%11	0.3193	604.6	1141.3	604.6	1.8877	50.911	0.000	0.000	0.000	23.106	25.984
180.0	2.373%11	0.4413	627.6	1271.7	627.6	2.0262	69.486	0.000	0.000	0.000	12.802	17.712
190.0	3.402%11	0.6326	645.4	1396.8	647.4	2.1577	80.437	0.000	0.000	0.000	6.468	13.096
200.0	4.318%11	0.8030	659.6	1518.3	667.1	2.2759	85.627	0.000	0.000	0.000	3.214	11.159
210.0	4.966%11	0.9235	671.0	1575.0	686.9	2.2929	88.197	0.000	0.000	0.000	1.594	10.209
220.0	5.299%11	0.9855	680.4	1617.9	706.6	2.2895	89.799	0.000	0.000	0.000	0.790	9.411
230.0	5.377%11	1.0000	688.1	1643.2	726.4	2.2621	91.075	0.000	0.000	0.000	0.392	8.533
240.0	5.341%11	0.9934	694.5	1650.0	746.2	2.2114	92.251	0.000	0.000	0.000	0.194	7.555
260.0	5.105%11	0.9493	704.3	1619.6	785.7	2.0614	94.551	0.000	0.000	0.000	0.048	5.401
280.0	4.691%11	0.8725	704.0	1575.0	825.2	1.8960	96.813	0.000	0.000	0.000	0.012	3.175
300.0	4.168%11	0.7751	715.7	1519.6	864.7	1.7573	98.000	0.000	0.000	0.000	0.003	1.997
320.0	3.600%11	0.6696	719.0	1498.1	904.3	1.6566	98.074	0.000	0.000	0.000	0.001	1.926
340.0	3.043%11	0.5660	721.4	1498.6	944.0	1.5876	98.074	0.000	0.000	0.000	0.000	0.988
360.0	2.533%11	0.4710	723.1	1514.9	983.9	1.5398	98.072	1.516	0.168	0.000	0.000	0.243
380.0	2.088%11	0.3882	724.4	1541.2	1024.3	1.5046	98.070	1.684	0.187	0.000	0.000	0.060
400.0	1.713%11	0.3187	725.3	1573.3	1066.2	1.4756	98.066	1.728	0.192	0.000	0.000	0.015
420.0	1.407%11	0.2617	726.0	1608.4	1116.1	1.4476	98.058	1.745	0.194	0.000	0.000	0.004
440.0	1.160%11	0.2158	726.6	1645.5	1160.4	1.4181	97.934	1.858	0.206	0.000	0.000	0.001
460.0	9.641%10	0.1793	727.0	1683.5	1214.1	1.3867	96.883	2.805	0.312	0.000	0.000	0.000
480.0	8.089%10	0.1504	727.3	1722.2	1270.7	1.3553	95.373	4.165	0.463	0.000	0.000	0.000
500.0	6.864%10	0.1277	727.6	1761.1	1328.8	1.3254	93.859	5.527	0.614	0.000	0.000	0.000
520.0	5.896%10	0.1097	728.3	1957.5	1623.4	1.2058	92.356	6.879	0.764	0.000	0.000	0.000
540.0	5.129%10	0.0954	728.4	1996.8	1487.5	1.2975	91.914	8.227	0.914	0.000	0.000	0.000
560.0	4.519%10	0.0840	728.5	2036.2	1741.4	1.2718	90.859	9.575	1.064	0.000	0.000	0.000
580.0	4.030%10	0.0750	728.6	2075.5	1800.3	1.2481	89.361	10.934	1.215	0.000	0.000	0.000
600.0	3.637%10	0.0676	728.3	1957.5	1623.4	1.2058	86.318	12.314	1.368	0.000	0.000	0.000
620.0	3.318%10	0.0617	728.4	1996.8	1682.4	1.1869	84.744	13.730	1.526	0.000	0.000	0.000
640.0	3.059%10	0.0569	728.5	2036.2	1741.4	1.1693	83.113	15.198	1.689	0.000	0.000	0.000
660.0	2.846%10	0.0529	728.5	2075.5	1800.3	1.1529	81.408	16.732	1.859	0.000	0.000	0.000
680.0	2.671%10	0.0497	728.6	2114.9	1859.3	1.1375	79.617	18.345	2.038	0.000	0.000	0.000
700.0	2.526%10	0.0470	728.6	2154.3	1918.1	1.1231	77.735	20.227	0.000	0.000	0.000	0.000
720.0	2.406%10	0.0447	728.6	2193.6	1976.9	1.1096	75.767	21.810	2.423	0.000	0.000	0.000
740.0	2.305%10	0.0429	728.7	2233.0	2035.6	1.0970	73.729	23.644	2.627	0.000	0.000	0.000
760.0	2.220%10	0.0413	728.7	2272.3	2094.1	1.0851	71.645	25.519	2.835	0.000	0.000	0.000
780.0	2.149%10	0.0400	728.7	2311.7	2152.4	1.0740	69.539	27.415	3.046	0.000	0.000	0.000
800.0	2.089%10	0.0389	728.7	2351.1	2210.3	1.0637	67.434	29.310	3.257	0.000	0.000	0.000

WE PUT B1= 3.0TO GET HST

INPUT: LATI= 35.7 LONGI= 140.0 R= 10 MONTH=12 HHTUR= 7.2

CALCULATED VALUES: MLAT= 25.6 MLONG= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XH1= 90.0
 SUNRISE: 7.2 L.T. SUNSET: 16.8 L.T. SUN DEC. = -22.9
 NMFF2=1.76%11 NMFl1= 0.00%-01 NMME=3.29%10 NMDF=4.00%08
 HMFF2=238.2 HMFl1= 0.0 HME=107.5 HMD= 84.5

	NE	TN	TE	TI	TE/TI	RDD+	RDHE+	RDD2+	RDNO+
H	N/HMAX	-1	-1	-1	-1	-1	-1	-1	-1
80.0	2.833%08	0.0016	-1	-1	-1	-1	-1	-1	-1
85.0	4.098%08	0.0023	-1	-1	-1	-1	-1	-1	-1
90.0	1.817%09	0.0103	-1	-1	-1	-1	-1	-1	-1
95.0	0.1.180%10	0.0670	-1	-1	-1	-1	-1	-1	-1
100.0	2.660%10	0.1511	-1	-1	-1	0.003	0.000	0.000	82.4229
105.0	3.263%10	0.1853	-1	-1	-1	0.006	0.000	0.000	79.5955
110.0	3.172%10	0.1802	-1	-1	-1	0.012	0.000	0.000	76.3133
115.0	2.595%10	0.1474	-1	-1	-1	0.023	0.000	0.000	72.5353
120.0	2.053%10	0.1166	289.3	289.3	1.0000	0.044	0.000	0.000	68.2558
125.0	1.828%10	0.1038	329.8	361.8	1.0968	0.084	0.000	0.000	63.621
130.0	1.940%10	0.1102	369.2	433.0	1.1730	0.161	0.000	0.000	59.123
135.0	2.271%10	0.1290	405.6	501.3	1.2361	0.307	0.000	0.000	55.754
140.0	2.687%10	0.1526	437.3	565.0	1.2920	0.584	0.000	0.000	54.4116
145.0	3.566%10	0.2025	486.1	677.6	1.3941	2.074	0.000	0.000	56.0466
150.0	4.191%10	0.2380	519.4	774.8	1.4917	6.909	0.000	0.000	56.461
155.0	5.073%10	0.2881	542.9	862.1	1.5880	19.661	0.000	0.000	49.703
160.0	6.796%10	0.3860	560.2	943.2	1.6799	41.885	0.000	0.000	49.636
165.0	9.796%10	0.5563	573.4	1020.3	1.7594	63.787	0.000	0.000	21.641
170.0	1.271%11	0.7218	583.8	1094.5	1.8294	76.967	0.000	0.000	11.2228
175.0	1.509%11	0.8571	592.1	1133.0	1.8371	83.283	0.000	0.000	10.559
180.0	1.668%11	0.9472	599.0	1163.7	1.8323	86.496	0.000	0.000	11.2228
185.0	1.745%11	0.9911	604.6	1185.0	1.8133	88.560	0.000	0.000	9.679
190.0	9.796%10	0.9998	609.2	1196.5	1.7807	90.243	0.000	0.000	18.8916
195.0	1.760%11	0.9998	616.3	1196.1	1.6876	93.359	0.000	0.000	6.630
200.0	1.721%11	0.9777	616.3	1182.2	1.8271	96.398	0.000	0.000	3.600
205.0	1.625%11	0.9229	621.1	1172.7	1.4990	98.000	0.000	0.000	2.000
210.0	1.487%11	0.8446	624.5	1174.8	1.4342	98.100	0.000	0.000	1.900
215.0	1.326%11	0.7529	626.9	1174.8	1.3877	98.101	1.044	0.116	0.739
220.0	1.157%11	0.6573	628.7	1187.7	855.9	1.2573	0.000	0.000	0.101
225.0	9.949%10	0.5650	629.9	1208.4	892.6	1.3539	98.099	1.620	0.000
230.0	8.464%10	0.4807	630.8	1234.1	929.0	1.3284	98.096	1.701	0.189
235.0	7.161%10	0.4067	631.5	1262.6	965.0	1.3084	98.093	1.715	0.191
240.0	6.051%10	0.3437	632.0	1280.5	999.9	1.2805	98.084	1.724	0.000
245.0	5.126%10	0.2911	632.4	1299.3	1033.3	1.2379	97.961	1.835	0.204
250.0	2.508%10	0.1424	633.4	1318.6	1065.2	1.1655	96.910	2.781	0.309
255.0	2.241%10	0.1273	633.5	1328.2	1096.0	1.2210	95.399	4.141	0.460
260.0	2.024%10	0.1150	633.6	1321.9	1358.0	1.2057	93.884	5.504	0.612
265.0	2.243%10	0.1842	633.1	1343.7	1126.4	1.1420	92.381	6.857	0.762
270.0	2.837%10	0.1611	633.3	1377.9	1156.5	1.1915	90.884	8.204	0.912
275.0	1.702%10	0.0967	633.7	1397.9	1186.5	1.1781	89.553	9.553	0.000
280.0	1.582%10	0.0899	633.4	1417.8	1216.5	1.1655	89.386	8.386	0.000
285.0	1.483%10	0.0842	633.8	1517.8	1366.4	1.1534	87.876	10.912	1.212
290.0	1.401%10	0.0796	633.8	1537.8	1246.5	1.1012	79.639	18.325	1.366
295.0	1.847%10	0.1049	633.6	1457.8	1276.5	1.1420	86.341	12.293	0.000
300.0	1.332%10	0.0757	633.8	1557.8	1156.5	1.1915	92.381	6.857	0.762
305.0	1.702%10	0.0967	633.7	1477.8	1306.5	1.1311	84.767	13.709	1.523
310.0	1.582%10	0.0724	633.9	1577.8	1456.2	1.0922	75.787	21.791	2.421
315.0	1.226%10	0.0696	633.9	1597.8	1336.5	1.1207	83.136	15.178	1.686
320.0	1.186%10	0.0673	633.9	1617.8	1366.4	1.1107	81.431	16.712	1.857
325.0	1.151%10	0.0654	633.9	1637.8	1396.4	1.1012	79.639	18.325	2.036
330.0	1.122%10	0.0637	633.9	1657.8	1426.3	1.0922	77.756	20.020	2.224
335.0	1.091%10	0.0621	633.9	1677.8	1406.5	1.0835	75.787	21.791	2.421
340.0	1.275%10	0.0724	633.9	1697.8	1336.5	1.1207	83.136	15.178	1.686
345.0	1.226%10	0.0696	633.9	1717.8	1406.1	1.0751	73.749	23.626	0.000
350.0	1.186%10	0.0673	633.9	1737.8	1486.1	1.0672	71.665	25.502	2.834
355.0	1.151%10	0.0654	633.9	1757.8	1515.9	1.0596	69.558	27.398	3.044
360.0	1.122%10	0.0637	633.9	1777.8	1545.6	1.0525	67.452	29.293	3.255

WE PUT W1= 3.070 GET HST

INPUT: LAT1 = 35.7 LON1 = 140.0 R=100 HGT, TH= 3 HGTUR=12.0

CALCULATED VALUES: LAT= 25.6 NLAT=G= 206.0
 DIP= 48.6 MJDIP= 45.3 MAGLA= 29.6 XH= 39.0
 SUNRISE: 6:2 L.T. SUNSET: 17:8 L.T. SUN DEC.= -3.3
 HGF1=1.73%12 HMF1= 3.34%11 HME=1.60%11 NID=1.22%09
 HGF2=307.3 HMF2=199.7 HME=110.0

	NE	N/IMAX	TE	T1	TE/T1	RDD+	RDD-	RDD0+	RDD0-	RDD2+	RDD2-	RDD4+	RDD4-	RDN0+	RDN-
H.	80.0	1.163%09	6.7%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	80.0	2.407%09	0.0014	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	90.0	2.357%10	0.0137	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	95.0	8.077%10	0.0468	-1	-1	-1	-1	-1	-1	0.322	0.000	0.000	0.000	62.797	36.880
	100.0	1.365%11	0.0791	-1	-1	-1	-1	-1	-1	0.488	0.000	0.000	0.000	60.122	39.390
	105.0	1.581%11	0.0916	-1	-1	-1	-1	-1	-1	0.739	0.000	0.000	0.000	57.493	41.768
	110.0	1.603%11	0.0929	-1	-1	-1	-1	-1	-1	1.118	0.000	0.000	0.000	54.818	44.064
	115.0	1.554%11	0.0900	-1	-1	-1	-1	-1	-1	1.695	0.000	0.000	0.000	51.924	46.386
	120.0	1.538%11	0.0891	336.9	336.9	1.0000	1.0000	2.552	0.000	0.000	0.000	48.604	48.845		
	125.0	1.607%11	0.0931	395.7	435.4	3.957	1.1003	3.844	0.000	0.000	0.000	44.831	51.324		
	130.0	1.618%11	0.0938	453.1	532.4	453.1	1.1751	5.771	0.000	0.000	0.000	40.864	53.365		
	135.0	1.631%11	0.0945	508.5	627.5	508.5	1.2341	8.609	0.000	0.000	0.000	37.000	54.391		
	140.0	1.647%11	0.0954	560.4	719.1	560.4	1.2832	18.448	0.000	0.000	0.000	30.090	51.462		
	145.0	1.686%11	0.0977	650.8	888.8	650.8	1.3657	35.534	0.000	0.000	0.000	24.228	40.237		
	150.0	1.742%11	0.1009	723.2	1040.5	723.2	1.4389	56.597	0.000	0.000	0.000	18.777	24.626		
	160.0	1.825%11	0.1057	780.4	1177.1	780.4	1.5083	72.989	0.000	0.000	0.000	13.542	13.469		
	170.0	1.966%11	0.1139	826.0	1392.1	826.0	1.5763	81.759	0.000	0.000	0.000	9.404	8.837		
	180.0	2.474%11	0.1433	863.0	1418.4	863.0	1.6436	85.877	0.000	0.000	0.000	6.479	7.643		
	190.0	3.457%11	0.2003	893.3	1528.0	893.3	1.7106	88.060	0.000	0.000	0.000	4.460	7.480		
	200.0	5.802%11	0.3362	918.3	1585.0	918.3	1.7261	98.000	0.000	0.000	0.000	3.069	7.376		
	210.0	8.347%11	0.4836	939.1	1628.1	939.1	1.7338	89.555	0.000	0.000	0.000	2.112	7.065		
	220.0	1.722%12	0.9976	956.4	1653.5	956.4	1.7289	90.823	0.000	0.000	0.000	1.453	6.521		
	230.0	1.072%12	0.6212	970.9	1660.3	970.9	1.7101	92.025	0.000	0.000	0.000	0.688	4.902		
	240.0	1.270%12	0.7357	1026.9	1629.2	993.0	1.7406	94.410	0.000	0.000	0.000	0.326	2.911		
	260.0	1.533%12	0.8881	993.0	1008.5	1008.5	1.009.1	1.5590	0.000	0.000	0.000	0.154	1.846		
	280.0	1.666%12	0.9655	1019.3	1527.4	1024.4	1.4910	98.000	0.000	0.000	0.000	0.073	1.850		
	300.0	1.722%12	0.9900	1026.9	1505.3	1039.8	1.4476	98.077	0.000	0.000	0.000	0.035	1.313		
	320.0	1.709%12	0.9900	1026.9	1505.3	1026.9	1.4476	98.077	0.000	0.000	0.000	0.035	1.313		
	340.0	1.618%12	0.9375	1032.4	1505.5	1055.4	1.4264	98.075	0.129	0.000	0.000	0.016	0.622		
	360.0	1.467%12	0.8501	1036.3	1521.6	1071.6	1.4200	98.075	1.158	0.000	0.000	0.015	0.295		
	380.0	1.281%12	0.7421	1039.2	1547.7	1089.0	1.4220	98.073	1.462	0.000	0.000	0.008	0.007		
	400.0	1.084%12	0.6279	1041.4	1579.9	1109.8	1.4236	98.069	0.179	0.000	0.000	0.004	0.139		
	420.0	8.945%12	0.5183	1043.0	1615.3	1137.1	1.4205	98.061	1.684	0.000	0.000	0.002	0.006		
	440.0	7.256%11	0.4204	1044.3	1652.7	1174.6	1.4264	98.058	0.518	0.000	0.000	0.001	0.031		
	460.0	5.822%11	0.3373	1045.2	1691.2	1222.2	1.4200	98.055	1.827	0.000	0.000	0.000	0.015		
	480.0	4.648%11	0.2693	1046.0	1730.3	1276.4	1.4200	98.052	2.223	0.000	0.000	0.000	0.000		
	500.0	3.712%11	0.2151	1046.6	1769.6	1333.9	1.3267	98.051	2.613	0.000	0.000	0.000	0.000		
	520.0	2.979%11	0.1726	1047.1	1809.2	1392.7	1.2991	97.938	3.031	0.000	0.000	0.000	0.000		
	540.0	2.410%11	0.1396	1047.4	1848.8	1452.0	1.2733	90.862	3.788	0.000	0.000	0.000	0.000		
	560.0	1.970%11	0.1142	1047.8	1888.5	1511.5	1.2494	95.887	4.155	0.000	0.000	0.000	0.000		
	580.0	1.631%11	0.0945	1048.7	1928.3	1571.1	1.2273	87.855	10.931	0.000	0.000	0.000	0.000		
	600.0	1.368%11	0.0793	1048.2	1968.0	1630.7	1.2068	86.321	12.311	0.000	0.000	0.000	0.000		
	620.0	1.164%11	0.0674	1048.4	2007.8	1690.4	1.1878	84.747	13.728	0.000	0.000	0.000	0.000		
	640.0	1.004%11	0.0582	1048.6	2047.5	1750.0	1.1700	83.116	15.196	0.000	0.000	0.000	0.000		
	660.0	8.783%10	0.0509	1048.7	2087.3	1809.5	1.1535	89.364	9.572	0.000	0.000	0.000	0.000		
	680.0	7.784%10	0.0451	1048.8	2127.1	1571.1	1.2273	87.855	10.931	0.000	0.000	0.000	0.000		
	700.0	6.985%10	0.0405	1048.9	2166.8	1928.6	1.1235	77.737	12.311	0.000	0.000	0.000	0.000		
	720.0	6.340%10	0.0367	1049.0	2206.6	1988.0	1.1100	75.769	21.808	0.000	0.000	0.000	0.000		
	740.0	5.817%10	0.0337	1049.0	2246.4	2047.2	1.0973	73.732	23.642	0.000	0.000	0.000	0.000		
	760.0	5.389%10	0.0312	1049.1	2286.1	2106.4	1.0853	71.647	25.517	0.000	0.000	0.000	0.000		
	780.0	5.037%10	0.0292	1049.1	2325.9	2165.2	1.0742	69.541	27.413	0.000	0.000	0.000	0.000		
	800.0	4.746%10	0.0275	1049.2	2365.7	2125.7	1.0638	67.436	29.308	0.000	0.000	0.000	0.000		
	WE PUT B1= 3.0TU GET HST														

INPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH= 3 HOUR= 6.2

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DIP= 48.6 HJD/DIP= 43.3 MAGLA= 29.6 XHI= 90.0
 SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC.= -3.3
 NMF2=5.09%11 NMF1= 0.00%-01 NME=4.00%08 NMD=4.00%08
 HMF2=297.3 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/HMAX	TN	TE	T1	TE/T1	RDO+	RDH+	RDHE+												
80.0	2.833%08	5.6%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
85.0	4.098%08	8.1%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
90.0	1.821%09	0.0036	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
95.0	1.259%10	0.0247	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
100.0	3.086%10	0.0607	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
105.0	3.963%10	0.0779	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
110.0	3.872%10	0.0761	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
115.0	3.198%10	0.0629	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
120.0	2.568%10	0.0505	321.1	321.1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
125.0	2.307%10	0.0454	373.8	397.6	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638	1.0638
130.0	2.436%10	0.0479	425.1	472.8	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122	1.1122
135.0	2.815%10	0.0553	474.1	545.7	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509	1.1509
140.0	3.293%10	0.0647	519.1	614.5	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838	1.1838
150.0	4.354%10	0.0856	594.4	737.5	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408	1.2408
160.0	5.338%10	0.1049	651.5	842.3	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930	1.2930
170.0	6.621%10	0.1302	694.7	933.3	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434	1.3434
180.0	8.359%10	0.1643	728.1	1014.3	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932	1.3932
190.0	1.090%11	0.2143	754.5	1088.4	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427	1.4427
200.0	1.511%11	0.2970	775.7	1157.4	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921	1.4921
210.0	2.035%11	0.4001	793.1	1195.8	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078	1.5078
220.0	2.603%11	0.5118	807.4	1225.8	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181	1.5181
230.0	3.176%11	0.6245	819.3	1245.7	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204	1.5204
240.0	3.714%11	0.7302	829.2	1255.3	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329	1.5329
260.0	4.557%11	0.8958	844.2	1249.8	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709	1.4709
280.0	4.993%11	0.9816	854.6	1229.7	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136	1.4136
300.0	5.085%11	0.9997	861.9	1213.3	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630	1.3630
320.0	4.968%11	0.9766	867.1	1207.8	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267	1.3267
340.0	4.688%11	0.9216	870.8	1212.8	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032	1.3032
360.0	4.288%11	0.8429	873.5	1225.3	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885	1.2885
380.0	3.818%11	0.7505	875.4	1242.6	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788	1.2788
400.0	3.325%11	0.6537	876.9	1262.7	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714	1.2714
420.0	2.848%11	0.5599	878.0	1280.5	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604	1.2604
440.0	2.410%11	0.4739	878.8	1299.3	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481	1.2481
460.0	2.026%11	0.3983	879.5	1318.6	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342	1.2342
480.0	1.698%11	0.3339	880.0	1328.3	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197	1.2197
500.0	1.425%11	0.2802	880.4	1328.1	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167	1.2167
520.0	1.201%11	0.2361	880.7	1328.0	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156	1.2156
540.0	1.019%11	0.2003	881.0	1329.7	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186	1.2186
560.0	8.714%10	0.1713	881.2	1417.9	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166	1.2166
580.0	7.526%10	0.1479	881.4	1437.9	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146	1.2146
600.0	6.567%10	0.1291	881.5	1457.9	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126	1.2126
620.0	5.792%10	0.1139	881.6	1477.8	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096	1.2096
640.0	5.164%10	0.1015	881.7	1497.8	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064	1.2064
660.0	4.652%10	0.0915	881.8	1517.8	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032	1.2032
680.0	4.233%10	0.0832	881.9	1537.8	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000
700.0	3.889%10	0.0765	881.9	1557.8	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978	1.1978
720.0	3.604%10	0.0709	882.0	1577.8	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945	1.1945
740.0	3.368%10	0.0662	882.0	1597.8	1.1912	1															

INPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: NLAT= 25.6 MLNG= 206.6
 DIP= 48.6 MDIP= 43.3 MAGLA= 29.6 XHI= 147.6
 SUNRISE: 6.2 L.T. SUNSET: 17.8 L.T. SUN DEC.= -3.3
 NMF1= 5.51% NMFL1= 0.000%-01 NMME= 3.20%09 NMD= 4.00%08
 NMF2= 347.7 HMFL1= 0.0 HME= 105.0 HMD= 88.0

H	NE	N NMAX	TN	TE	T1	TE/T1	RDO+	RDH+	RDHE+	RD0+	RD2+	RDNO+
80.0	5.417%05	9.8%-7	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.474%08	4.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.729%08	8.6%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.508%09	0.0046	-1	-1	-1	-1	-1	0.012	0.000	0.000	0.000	18.280
100.0	3.193%09	0.0058	-1	-1	-1	-1	0.019	0.000	0.000	0.000	0.000	81.709
105.0	3.201%09	0.0058	-1	-1	-1	-1	0.030	0.000	0.000	0.000	0.000	78.981
110.0	2.617%09	0.0047	-1	-1	-1	-1	0.049	0.000	0.000	0.000	0.000	75.907
115.0	1.706%09	0.0031	-1	-1	-1	-1	0.079	0.000	0.000	0.000	0.000	72.560
120.0	1.086%09	0.0020	318.3	318.3	1.0000	1.0000	0.000	0.000	0.000	0.000	0.000	69.199
125.0	7.642%08	0.0014	369.9	371.6	1.0044	1.0044	0.000	0.000	0.000	0.000	0.000	66.317
130.0	6.320%08	0.0011	420.2	423.5	1.0078	1.0078	0.000	0.000	0.000	0.000	0.000	64.331
135.0	6.216%08	0.0011	468.1	473.0	1.0105	1.0105	0.000	0.000	0.000	0.000	0.000	63.174
140.0	7.098%08	0.0013	511.9	518.4	1.0128	1.0128	0.000	0.000	0.000	0.000	0.000	62.470
145.0	1.198%09	0.0022	584.6	594.4	1.0168	1.0168	0.000	0.000	0.000	0.000	0.000	61.333
150.0	2.094%09	0.0038	639.3	652.4	1.0205	1.0205	0.000	0.000	0.000	0.000	0.000	59.823
155.0	3.573%09	0.0065	680.3	696.7	1.0241	1.0241	0.000	0.000	0.000	0.000	0.000	59.078
160.0	6.017%09	0.0109	711.9	731.5	1.0276	1.0276	0.000	0.000	0.000	0.000	0.000	58.712
165.0	1.005%10	0.0182	736.8	759.7	1.0311	1.0311	0.000	0.000	0.000	0.000	0.000	54.998
170.0	2.741%10	0.0497	756.7	782.9	1.0346	1.0346	0.000	0.000	0.000	0.000	0.000	50.226
175.0	4.478%10	0.0813	773.0	802.5	1.0381	1.0381	0.000	0.000	0.000	0.000	0.000	46.383
180.0	7.239%10	0.1314	786.5	819.2	1.0416	1.0416	0.000	0.000	0.000	0.000	0.000	42.898
185.0	1.107%11	0.2009	806.8	846.1	1.0452	1.0452	0.000	0.000	0.000	0.000	0.000	39.050
190.0	1.666%10	0.3032	820.9	866.7	1.0487	1.0487	0.000	0.000	0.000	0.000	0.000	34.549
195.0	2.155%11	0.3911	830.6	883.0	1.0558	1.0558	0.000	0.000	0.000	0.000	0.000	23.397
200.0	3.397%11	0.6165	830.6	883.0	1.0609	1.0609	0.000	0.000	0.000	0.000	0.000	9.849
205.0	5.231%11	0.9493	837.5	896.4	1.0623	1.0623	0.000	0.000	0.000	0.000	0.000	1.848
210.0	4.503%11	0.8172	842.3	907.8	1.0614	1.0614	0.000	0.000	0.000	0.000	0.000	1.428
215.0	5.216%11	0.9466	842.3	906.8	1.0653	1.0653	0.000	0.000	0.000	0.000	0.000	0.653
220.0	4.829%11	0.8763	851.4	943.1	1.0690	1.0690	0.000	0.000	0.000	0.000	0.000	0.279
225.0	4.321%11	0.7842	852.4	943.2	1.0730	1.0730	0.000	0.000	0.000	0.000	0.000	0.004
230.0	5.493%11	0.9968	845.7	917.8	1.0771	1.0771	0.000	0.000	0.000	0.000	0.000	0.002
235.0	5.468%11	0.9922	848.2	926.8	1.0815	1.0815	0.000	0.000	0.000	0.000	0.000	0.119
240.0	5.493%11	0.9922	850.0	950.0	1.0857	1.0857	0.000	0.000	0.000	0.000	0.000	0.051
245.0	5.468%11	0.9922	851.4	943.4	1.0911	1.0911	0.000	0.000	0.000	0.000	0.000	0.022
250.0	5.282%11	0.4142	854.7	943.5	1.0950	1.0950	0.000	0.000	0.000	0.000	0.000	0.009
255.0	1.907%11	0.3461	855.0	943.6	1.0991	1.0991	0.000	0.000	0.000	0.000	0.000	0.000
260.0	3.770%11	0.6842	853.2	943.2	1.1030	1.1030	0.000	0.000	0.000	0.000	0.000	0.000
265.0	3.226%11	0.5854	853.8	943.3	1.1070	1.1070	0.000	0.000	0.000	0.000	0.000	0.000
270.0	1.907%11	0.724%	854.3	943.4	1.1110	1.1110	0.000	0.000	0.000	0.000	0.000	0.000
275.0	5.894%10	0.4142	854.7	943.5	1.1150	1.1150	0.000	0.000	0.000	0.000	0.000	0.000
280.0	9.767%10	0.1772	855.7	943.9	1.1190	1.1190	0.000	0.000	0.000	0.000	0.000	0.000
285.0	1.907%11	0.1535	855.0	944.0	1.1230	1.1230	0.000	0.000	0.000	0.000	0.000	0.000
290.0	1.597%11	0.1345	855.2	944.1	1.1270	1.1270	0.000	0.000	0.000	0.000	0.000	0.000
295.0	1.344%11	0.2433	855.4	944.2	1.1310	1.1310	0.000	0.000	0.000	0.000	0.000	0.000
300.0	1.140%11	0.4943	855.6	944.3	1.1350	1.1350	0.000	0.000	0.000	0.000	0.000	0.000
305.0	2.282%11	0.4142	854.7	943.5	1.1390	1.1390	0.000	0.000	0.000	0.000	0.000	0.000
310.0	5.345%10	0.0970	855.7	943.9	1.1430	1.1430	0.000	0.000	0.000	0.000	0.000	0.000
315.0	8.459%10	0.0970	855.0	944.0	1.1470	1.1470	0.000	0.000	0.000	0.000	0.000	0.000
320.0	4.899%10	0.0889	856.2	944.4	1.1510	1.1510	0.000	0.000	0.000	0.000	0.000	0.000
325.0	4.533%10	0.0823	856.2	944.5	1.1550	1.1550	0.000	0.000	0.000	0.000	0.000	0.000
330.0	6.571%10	0.1193	856.0	944.2	1.1590	1.1590	0.000	0.000	0.000	0.000	0.000	0.000
335.0	4.894%10	0.1070	856.1	944.2	1.1630	1.1630	0.000	0.000	0.000	0.000	0.000	0.000
340.0	5.894%10	0.0970	856.1	944.3	1.1670	1.1670	0.000	0.000	0.000	0.000	0.000	0.000
345.0	7.412%10	0.1345	855.9	944.1	1.1710	1.1710	0.000	0.000	0.000	0.000	0.000	0.000
350.0	4.233%10	0.0768	856.3	944.6	1.1750	1.1750	0.000	0.000	0.000	0.000	0.000	0.000
355.0	3.985%10	0.0723	856.3	944.7	1.1790	1.1790	0.000	0.000	0.000	0.000	0.000	0.000
360.0	3.780%10	0.0686	856.3	944.7	1.1830	1.1830	0.000	0.000	0.000	0.000	0.000	0.000
365.0	3.071%10	0.0621	856.1	920.6	1.1870	1.1870	0.000	0.000	0.000	0.000	0.000	0.000
370.0	2.808%10	0.0621	856.1	920.6	1.1910	1.1910	0.000	0.000	0.000	0.000	0.000	0.000
375.0	2.533%10	0.0621	856.1	920.6	1.1950	1.1950	0.000	0.000	0.000	0.000	0.000	0.000
380.0	2.233%10	0.0621	856.1	920.6	1.2000	1.2000	0.000	0.000	0.000	0.000	0.000	0.000
385.0	1.985%10	0.0621	856.1	920.6	1.2040	1.2040	0.000	0.000	0.000	0.000	0.000	0.000
390.0	1.780%10	0.0621	856.1	920.6	1.2080	1.2080	0.000	0.000	0.000	0.000	0.000	0.000
395.0	1.580%10	0.0621	856.1	920.6	1.2120	1.2120	0.000	0.000	0.000	0.000	0.000	0.000
400.0	1.480%10	0.0621	856.1	920.6	1.2160	1.2160	0.000	0.000	0.000	0.000	0.000	0.000
405.0	1.380%10	0.0621	856.1	920.6	1.2200	1.2200	0.000	0.000	0.000	0.000	0.000	0.000
410.0	1.280%10	0.0621	856.1	920.6	1.2240	1.2240	0.000	0.000	0.000	0.000	0.000	0.000
415.0	1.180%10	0.0621	856.1	920.6	1.2280	1.2280	0.000	0.000	0.000	0.000	0.000	0.000
420.0	1.080%10	0.0621	856.1	920.6	1.2320	1.2320	0.000	0.000	0.000	0.000	0.000	0.000
425.0	9.800%10	0.0621	856.1	920.6	1.2360	1.2360	0.000	0.000	0.000	0.000	0.000	0.000
430.0	8.800%10	0.0621	856.1	920.6	1.2400	1.2400	0.000	0.000	0.000	0.000	0.000	0.000
435.0	7.800%10	0.0621	856.1	920.6	1.2440	1.2440	0.000	0.000	0.000	0.000	0.000	0.000
440.0	6.800%10	0.0621	856.1	920.6	1.2480	1.2480	0.000	0.000	0.000	0.000	0.000	0.000
445.0	5.800%10	0.0621	856.1	920.6	1.2520	1.2520	0.000	0.000	0.000	0.000	0.000	0.000
450.0	4.800%10	0.0621	856.1	920.6	1.2560	1.2560	0.000	0.000	0.000	0.000	0.000	0.000
455.0	3.800%10	0.0621	856.1	920.6	1.2600	1.2600	0.000	0.000	0.000	0.000	0.000	0.000
460.0	2.800%10	0.0621	856.1	920.6	1.2640	1.2640	0.000	0.000	0.000	0.000	0.000	0.000
465.0	1.800%10	0.0621	856.1	920.6	1.2680	1.2680	0.000	0.000	0.000	0.000	0.000	0.000
470.0	800.0	3.071%10	856.1	920.6	1.2720	1.2720	0.000	0.000	0.000	0.000	0.000	0.000
475.0	700.0	5.345%10	856.1	920.6	1.2							

INPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH= 6 HOUR=12.0

CALCULATED VALUES: MLAT= 25.6 MLONG= 206.6
 DTP= 48.6 MCOTP= 43.3 MAGLA= 29.6 XHI= 12.6
 SUNRISE: 4.8 L.T. SUNSET: 19.2 L.T. SUN DEC.= 23.1
 NMFL= 8.29%11 NMFL= 3.68%11 NAME= 1.78%11 NMD= 1.33%09
 HMFL= 312.4 HMFL= 211.0 HME= 110.0 HMD= 81.0

II	HE	N/HMAX	TN	TE	TI	TE/TI	RDD+	RDH+	RDE+	RDO+
80.0	1.275%09	0.0015	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.670%09	0.0032	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.612%10	0.0315	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.944%10	0.1079	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.513%11	0.1825	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.755%11	0.2117	-1	-1	-1	-1	0.336	0.000	0.000	0.000
110.0	1.779%11	0.2146	-1	-1	-1	-1	0.482	0.000	0.000	0.000
115.0	1.731%11	0.2088	-1	-1	-1	-1	0.691	0.000	0.000	0.000
120.0	1.714%11	0.2068	339.4	339.4	-1	-1	0.989	0.000	0.000	0.000
125.0	1.790%11	0.2160	399.0	437.7	1.0000	1.415	0.000	0.000	0.000	0.000
130.0	1.823%11	0.2199	457.3	457.3	1.0969	2.024	0.000	0.000	0.000	0.000
135.0	1.859%11	0.2242	513.7	513.7	1.1690	2.887	0.000	0.000	0.000	0.000
140.0	1.897%11	0.2283	566.7	629.7	1.2257	4.107	0.000	0.000	0.000	0.000
150.0	1.983%11	0.2392	659.5	721.4	1.2728	5.809	0.000	0.000	0.000	0.000
160.0	2.087%11	0.2517	734.4	1043.7	1.3517	11.251	0.000	0.000	0.000	0.000
170.0	2.217%11	0.2675	794.0	1180.6	1.4211	19.962	0.000	0.000	0.000	0.000
180.0	2.396%11	0.2890	841.9	1305.8	1.4868	30.669	0.000	0.000	0.000	0.000
190.0	2.721%11	0.3283	880.8	1422.0	1.5510	40.806	0.000	0.000	0.000	0.000
200.0	3.246%11	0.3916	912.7	1531.2	1.6145	49.733	0.000	0.000	0.000	0.000
210.0	3.721%11	0.4489	939.2	1588.4	1.6777	58.351	0.000	0.000	0.000	0.000
220.0	4.376%11	0.5279	961.2	1631.7	1.6913	67.504	0.000	0.000	0.000	0.000
230.0	5.143%11	0.6204	979.6	1657.1	1.6975	77.593	0.000	0.000	0.000	0.000
240.0	5.872%11	0.7084	994.9	1663.8	1.6916	88.070	0.000	0.000	0.000	0.000
250.0	7.097%11	0.8562	1018.5	1632.5	1.6723	95.635	0.000	0.000	0.000	0.000
260.0	7.889%11	0.9517	1034.9	1576.2	1.6029	98.527	0.000	0.000	0.000	0.000
280.0	8.242%11	0.9942	1046.3	1530.1	1.6231	103.521	0.000	0.000	0.000	0.000
300.0	8.264%11	0.9969	1054.5	1507.9	1.6413	104.613	0.000	0.000	0.000	0.000
320.0	8.264%11	0.9969	1071.6	1508.0	1.6423	105.912	0.000	0.000	0.000	0.000
340.0	7.966%11	0.9610	1060.3	1071.4	1.4075	107.055	0.000	0.000	0.000	0.000
360.0	7.388%11	0.8913	1064.5	1524.2	1.6029	108.42	1.4058	0.000	0.000	0.000
380.0	6.623%11	0.7989	1067.6	1550.4	1.6114	109.85	1.5231	0.000	0.000	0.000
400.0	5.769%11	0.6959	1069.9	1582.6	1.6116	111.63	1.4613	0.000	0.000	0.000
420.0	4.911%11	0.5924	1071.6	1618.3	1.6117	113.03	1.4237	0.000	0.000	0.000
440.0	4.111%11	0.4960	1072.9	1655.8	1.6117	114.47	1.4075	0.000	0.000	0.000
460.0	3.404%11	0.4106	1073.9	1694.4	1.6029	115.92	1.4058	0.000	0.000	0.000
480.0	2.803%11	0.3381	1074.7	1733.7	1.6224	117.37	1.4058	0.000	0.000	0.000
500.0	2.306%11	0.2782	1075.4	1773.2	1.6224	118.82	1.4058	0.000	0.000	0.000
520.0	1.903%11	0.2296	1075.9	1812.9	1.6224	119.29	1.4058	0.000	0.000	0.000
540.0	1.580%11	0.1906	1076.3	1852.7	1.6224	120.74	1.4058	0.000	0.000	0.000
560.0	1.324%11	0.1597	1076.6	1892.6	1.6224	122.21	1.4058	0.000	0.000	0.000
580.0	1.121%11	0.1352	1076.9	1932.5	1.6224	123.68	1.4058	0.000	0.000	0.000
600.0	9.598%10	0.1158	1077.1	1972.4	1.6224	125.14	1.4058	0.000	0.000	0.000
620.0	8.320%10	0.1004	1077.3	2012.4	1.6224	126.6	1.4058	0.000	0.000	0.000
640.0	7.300%10	0.0881	1077.5	2052.3	1.6224	128.11	1.4058	0.000	0.000	0.000
660.0	6.482%10	0.0782	1077.6	2092.2	1.6224	129.58	1.4058	0.000	0.000	0.000
680.0	5.823%10	0.0702	1077.7	2132.2	1.6224	131.04	1.4058	0.000	0.000	0.000
700.0	5.288%10	0.0638	1077.8	2172.1	1.6224	132.5	1.4058	0.000	0.000	0.000
720.0	4.852%10	0.0585	1077.9	2212.1	1.6224	134.0	1.4058	0.000	0.000	0.000
740.0	4.494%10	0.0542	1078.0	2252.0	1.6224	135.5	1.4058	0.000	0.000	0.000
760.0	4.199%10	0.0507	1078.0	2291.9	1.6224	137.0	1.4058	0.000	0.000	0.000
780.0	3.954%10	0.0477	1078.1	2331.9	1.6224	138.5	1.4058	0.000	0.000	0.000
800.0	3.750%10	0.0452	1078.1	2371.8	1.6224	140.0	1.4058	0.000	0.000	0.000

WE PUT BL= 3.070 GET HIST

INPUT: LAT= 35.7 LONGI= 140.0 R=100 MONTH= 6 HNUR= 4.8

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6 XHI= 90.0
 DTP= 48.6 MDIP= 43.3 HAGL= 29.6 XHI= 90.0
 SUNRISE= 4:48 L.T. SUNSET= 19:2 L.T. SUN DEC.= 23.1
 NMF2= 4.90% NMF1= 0.00%-01 NAME=3.88%10 NMD=4.00%08
 HME2= 316.9 HME1= 0.00 HME=107.5 HMD= 84.5

TINPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 25.6 MLING= 206.6
 DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHI= 121.2
 SUNRISE: 4.8 L.T. SUNSET: 19.2 L.T. SUN DEC.= 23.
 NMF2=6.76%11 NMFL= 0.00% -01 NMME=3.20%09 NMD=4.00%08
 HMFD2=368.0 HMFL= 8.0 HMME=105.0 HMD= 87.9

INPUT: LAT= 35.7 LONGI= 140.0 R=100 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 25.6 MLONG= 206.6
 DTP= 48.6 MDIP= 43.3 MAGLA= 29.6 XHI= 58.6
 SUNRISE= 7:22 L.T. SUISET= 16:8 L.T. SUN DEC.= -22.9
 NMDF1= 0.00% -01 NMEI= 1.34% 11 NMD= 8.29% 08
 NMDF2= 1.62% 7 HMEI= 0.00% HME= 109.9 HMD= 81.1
 NMDF3= 2.65% 7 HMEI= 0.00% HME= 109.9 HMD= 81.1

INPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH=12 HOUR= 7.2

CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
 DTP= 48.6 MDIP= 43.3 MAGLA= 29.6 XHI= 90.0
 SUNRISE= 7.2 L.T. SUNSET= 16.8 L.T. SUN DEC.= -22.9
 NMF2= 4.38%11 NMFL1= 0.00%-01 HME= 4.24%10 NND= 4.00%08
 NMF2= 2.66%7 NMFL1= 0.0 HMD= 107.5 HME= 84.5

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDI+	RDI-	RDU+	RDU-	RDHE+	RDHE-	RDN+	RDN-
80.0	2.83%08	6.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.098%08	9.4%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.822%09	0.0042	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.281%10	0.0292	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.220%10	0.0735	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	4.192%10	0.0957	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	4.095%10	0.0935	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	3.350%10	0.0765	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	2.651%10	0.0605	321.3	321.3	1.0000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	31.698	68.258
125.0	2.360%10	0.0539	374.1	374.1	1.0630	0.084	0.000	0.000	0.000	0.000	0.000	0.000	36.294	63.621
130.0	2.504%10	0.0571	425.5	425.5	1.1108	0.161	0.000	0.000	0.000	0.000	0.000	0.000	40.716	59.123
135.0	2.932%10	0.0669	474.6	474.6	1.1490	0.307	0.000	0.000	0.000	0.000	0.000	0.000	43.939	55.754
140.0	3.468%10	0.0792	519.7	519.7	1.1814	0.584	0.000	0.000	0.000	0.000	0.000	0.000	45.000	54.416
150.0	4.663%10	0.0664	595.2	736.7	1.2377	2.074	0.000	0.000	0.000	0.000	0.000	0.000	41.880	56.046
160.0	6.024%10	0.1375	652.5	841.1	1.2891	6.909	0.000	0.000	0.000	0.000	0.000	0.000	36.631	56.461
170.0	7.952%10	0.1815	695.9	931.7	1.3388	19.661	0.000	0.000	0.000	0.000	0.000	0.000	30.703	49.636
180.0	1.097%11	0.2505	729.4	1012.3	1.3878	41.885	0.000	0.000	0.000	0.000	0.000	0.000	21.641	36.474
190.0	1.594%11	0.3637	756.0	1086.0	1.4366	63.787	0.000	0.000	0.000	0.000	0.000	0.000	10.559	25.653
200.0	2.164%11	0.4939	777.3	1154.5	1.4953	76.967	0.000	0.000	0.000	0.000	0.000	0.000	4.137	18.896
210.0	2.748%11	0.6277	794.8	1192.9	1.5009	83.288	0.000	0.000	0.000	0.000	0.000	0.000	1.545	15.167
220.0	3.289%11	0.7506	809.2	1222.9	1.5112	86.496	0.000	0.000	0.000	0.000	0.000	0.000	0.573	12.931
230.0	3.739%11	0.8533	821.1	1242.8	1.5135	88.560	0.000	0.000	0.000	0.000	0.000	0.000	0.212	11.228
240.0	4.069%11	0.9287	831.1	1252.5	1.5066	90.243	0.000	0.000	0.000	0.000	0.000	0.000	0.079	9.679
250.0	4.367%11	0.9966	846.2	1247.2	1.4650	93.359	0.000	0.000	0.000	0.000	0.000	0.000	0.011	6.630
260.0	4.349%11	0.9924	856.7	1227.4	1.4086	96.398	0.000	0.000	0.000	0.000	0.000	0.000	0.001	3.600
270.0	4.182%11	0.9544	864.0	1211.3	1.3589	98.000	0.000	0.000	0.000	0.000	0.000	0.000	2.000	
280.0	3.900%11	0.8900	869.0	1206.2	1.3234	98.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
290.0	3.539%11	0.8076	872.9	1211.6	1.3007	98.101	1.044	0.000	0.000	0.000	0.000	0.000	0.739	
300.0	3.137%11	0.7160	875.6	1224.5	951.7	1.2867	98.099	1.620	0.000	0.000	0.000	0.000	0.000	
310.0	2.729%11	0.6228	877.6	1242.2	972.2	1.2777	98.096	1.701	0.000	0.000	0.000	0.000	0.000	
320.0	2.340%11	0.5341	879.0	1262.6	993.4	1.2710	98.093	1.715	0.000	0.000	0.000	0.000	0.000	
330.0	2.011%11	0.4535	880.2	1280.5	1016.1	1.2601	98.084	1.724	0.000	0.000	0.000	0.000	0.000	
340.0	1.987%11	0.4781	882.9	1299.3	1041.1	1.2479	97.961	1.835	0.000	0.000	0.000	0.000	0.000	
350.0	1.987%11	0.4829	881.0	1318.7	1068.4	1.2342	96.910	1.824	0.000	0.000	0.000	0.000	0.000	
360.0	1.987%11	0.4931	881.0	1338.2	1097.2	1.2197	95.399	1.819	0.000	0.000	0.000	0.000	0.000	
370.0	1.987%11	0.5030	882.6	1358.0	1126.7	1.2053	93.884	1.804	0.000	0.000	0.000	0.000	0.000	
380.0	1.987%11	0.5133	882.9	1377.9	1156.5	1.1915	92.381	1.787	0.000	0.000	0.000	0.000	0.000	
390.0	1.987%11	0.5235	883.2	1397.9	1166.4	1.1782	90.884	1.764	0.000	0.000	0.000	0.000	0.000	
400.0	1.987%11	0.5335	883.2	1417.8	1216.4	1.1656	89.386	1.753	0.000	0.000	0.000	0.000	0.000	
410.0	1.987%11	0.5435	883.4	1437.8	1246.4	1.1536	87.876	1.741	0.000	0.000	0.000	0.000	0.000	
420.0	1.987%11	0.5535	884.1	1457.8	1276.4	1.1422	86.341	1.729	0.000	0.000	0.000	0.000	0.000	
430.0	1.987%11	0.5635	884.1	1477.8	1306.4	1.1312	84.762	1.709	0.000	0.000	0.000	0.000	0.000	
440.0	1.987%11	0.5735	884.2	1497.8	1336.3	1.1208	83.136	1.688	0.000	0.000	0.000	0.000	0.000	
450.0	1.987%11	0.5835	884.2	1517.8	1366.3	1.109	81.431	1.661	0.000	0.000	0.000	0.000	0.000	
460.0	1.987%11	0.5935	884.0	1537.8	1396.2	1.1014	79.639	1.635	0.000	0.000	0.000	0.000	0.000	
470.0	1.987%11	0.6035	884.1	1557.8	1426.2	1.0923	77.756	1.606	0.000	0.000	0.000	0.000	0.000	
480.0	1.987%11	0.6135	884.1	1577.8	1456.1	1.0836	75.787	1.577	0.000	0.000	0.000	0.000	0.000	
490.0	1.987%11	0.6235	884.2	1597.8	1485.9	1.0753	73.749	1.548	0.000	0.000	0.000	0.000	0.000	
500.0	1.987%11	0.6335	884.0	1617.8	1515.7	1.0673	71.665	1.519	0.000	0.000	0.000	0.000	0.000	
510.0	1.987%11	0.6435	884.3	1637.8	1545.4	1.0598	69.558	1.490	0.000	0.000	0.000	0.000	0.000	
520.0	1.987%11	0.6535	884.3	1657.8	1574.9	1.0526	67.452	1.461	0.000	0.000	0.000	0.000	0.000	
530.0	1.987%11	0.6635	884.3	1677.8	1594.5	1.0526	67.452	1.461	0.000	0.000	0.000	0.000	0.000	
540.0	1.987%11	0.6735	884.3	1697.8	1614.5	1.0455	66.452	1.452	0.000	0.000	0.000	0.000	0.000	
550.0	1.987%11	0.6835	884.3	1717.8	1631.4	1.0384	65.452	1.442	0.000	0.000	0.000	0.000	0.000	
560.0	1.987%11	0.6935	884.3	1737.8	1646.3	1.0313	64.452	1.432	0.000	0.000	0.000	0.000	0.000	
570.0	1.987%11	0.7035	884.3	1757.8	1661.2	1.0242	63.452	1.422	0.000	0.000	0.000	0.000	0.000	
580.0	1.987%11	0.7135	884.3	1777.8	1675.1	1.0171	62.452	1.412	0.000	0.000	0.000	0.000	0.000	
590.0	1.987%11	0.7235	884.3	1797.8	1689.0	1.0100	61.452	1.402	0.000	0.000	0.000	0.000	0.000	
600.0	1.987%11	0.7335	884.3	1817.8	1698.9	1.0029	60.452	1.392	0.000	0.000	0.000	0.000	0.000	
610.0	1.987%11	0.7435	884.3	1837.8	1708.8	0.9958	59.452	1.382	0.000	0.000	0.000	0.000	0.000	
620.0	1.987%11	0.7535	884.3	1857.8	1719.7	0.9887	58.452	1.372	0.000	0.000	0.000	0.000	0.000	
630.0	1.987%11	0.7635	884.3	1877.8	1729.6	0.9816	57.452	1.362	0.000	0.000	0.000	0.000	0.000	
640.0	1.987%11	0.7735	884.3	1897.8	1739.5	0.9745	56.452	1.352	0.000	0.000	0.000	0.000	0.000	
650.0	1.987%11	0.7835	884.3	1917.8	1749.4	0.9674	55.452	1.342	0.000	0.000	0.000	0.000	0.000	
660.0	1.987%11	0.7935	884.3	1937.8	1759.3	0.9603	54.452	1.332	0.000	0.000	0.000	0.000	0.000	
670.0	1.987%11	0.8035	884.3	1957.8	1769.2	0.9532	53.452	1.322	0.000	0.000	0.000	0.000	0.000	
680.0	1.987%11	0.8135	884.3	1977.8	1779.1	0.9461	52.452	1.312	0.000	0.000	0.000	0.000	0.000	
690.0	1.987%11	0.8235	884.3	1997.8	1789.0	0.9390	51.452	1.302	0.000	0.000	0.000	0.000	0.000	
700.0	1.987%11	0.8335	884.3	2017.8	1798.9	0.9319	50.452	1.292	0.000	0.000	0.000	0.000	0.000	
710.0	1.987%11	0.8435	884.3	2037.8	1807.8	0.9248	49.452	1.282	0.000	0.000	0.000	0.000	0.000	
720.0	1.987%11	0.8535	884.3	2057.8	1816.7	0.9177	48.452	1.272	0.000	0.000	0.000	0.000	0.000	
730.0	1.987%11	0.8635	884.3	2077.8	1825.6	0.9106	47.452	1.262	0.000					

```

INPUT: LATI= 35.7 LONGI= 140.0 R=100 MONTH=12 HOUR= 0.0
CALCULATED VALUES: MLAT= 25.6 MLNG= 206.6
DIP= 48.6 MODIP= 43.3 MAGLA= 29.6 XHI= 167.2
SUNRASE= 7 SUNSET= 16.8 L-T SUN DEC.= -22.9

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CALCULATED VALUES: MLAT = 25.6 MLNG = 206.0
 DIP = 48.6 MODIP = 43.3 MAGLA = 29.6 XH1 =
 SUNRISE = 7:2 L.T. SUNSET: 16:8 L.T. SU
 NMF1 = 1.9411 NMFI = 0.00%~01 NME = 3.20%09
 HMF2 = 237.4 HMFI = 0.0 HME = 105.0 HMD = 88.4

			YI	TE	TU	
N/NMAX	NE		-1	-1	-1	
H	0.0	5.033%05	2.6%-6			
	0.0	5.459%08	0.0013	-1	-1	
	0.5	2.459%08	0.0013	-1	-1	
	0.5	4.723%08	0.0013	-1	-1	
	0.5	2.505%09	0.0129	-1	-1	
	0.5	3.193%09	0.0164	-1	-1	
	0.5	3.201%09	0.0165	-1	-1	
	0.0	2.615%09	0.0135	-1	-1	
	0.5	1.703%09	0.0088	-1	-1	
	0.0	1.083%09	0.0056	316.9	316.9	
	0.0	7.610%08	0.0036	368.0	368.0	
	0.5	1.192%09	0.0032	417.8	417.8	
	0.0	6.288%08	0.0032	465.2	465.2	
	0.5	6.180%08	0.0032	465.2	465.2	
	0.0	7.055%08	0.0036	508.3	508.3	
	0.0	1.192%09	0.0061	579.8	579.8	
	0.0	2.086%09	0.0107	633.3	633.3	
	0.0	3.436%09	0.0177	673.4	673.4	
	0.0	4.679%09	0.0241	704.0	704.0	
	0.0	6.422%09	0.0331	728.2	728.2	
	0.0	8.911%09	0.0459	747.6	747.6	
	0.0	1.257%10	0.0647	763.4	763.4	
	0.0	1.819%10	0.0937	776.4	776.4	
	0.0	2.767%10	0.1425	787.1	787.1	
	0.0	4.305%10	0.2217	796.1	796.1	
	0.0	8.481%10	0.4368	809.7	809.7	
	0.0	1.318%11	0.6790	819.1	819.1	
	0.0	2.830.0	0.8739	825.7	825.7	
	0.0	1.697%11	0.9777	830.4	830.4	
	0.0	1.898%11	0.9997	833.7	833.7	
	0.0	1.941%11	0.9997	836.1	836.1	
	0.0	1.903%11	0.9802	837.9	837.9	
	0.0	1.812%11	0.9330	839.2	839.2	
	0.0	1.679%11	0.8649	842.4	842.4	
	0.0	1.522%11	0.7837	840.2	840.2	
	0.0	1.354%11	0.6974	841.0	841.0	
	0.0	1.189%11	0.6121	841.6	841.6	
	0.0	1.034%11	0.5324	842.0	842.0	
	0.0	8.948%10	0.4608	842.4	842.4	
	0.0	4.516%10	0.2326	843.4	843.4	
	0.0	4.023%10	0.2072	843.5	843.5	
	0.0	6.704%10	0.3452	842.9	842.9	
	0.0	5.836%10	0.3005	843.1	843.1	
	0.0	3.283%10	0.2633	843.3	843.3	
	0.0	5.113%10	0.1549	843.7	843.7	
	0.0	3.007%10	0.1127	843.8	843.8	
	0.0	2.779%10	0.1431	843.8	843.8	
	0.0	2.589%10	0.1333	843.8	843.8	
	0.0	3.618%10	0.1863	843.6	843.6	
	0.0	2.431%10	0.1252	843.9	843.9	
	0.0	2.298%10	0.1184	843.9	843.9	
	0.0	2.077%10	0.1127	844.0	844.0	
	0.0	2.044%10	0.1127	844.0	844.0	

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHI= 18.0
 SUNRISE: 6.1 L.T. SUNSET:17.9 L.T. SUN DEC.= -3.3
 NMF1= 2.47% NMF2=1.4% NME=1.43% NMD=6.18%
 HMF1=336.7 HMF2=229.9 HME=110.0 HMD= 81.0

H	N	E	NE	N/NMAX	TN	TE	T1	TE/T1	RDO+	RDO2+	RDE+	RDN+	RDN2+	
80.0	6.004%	0.8	5.2%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
85.0	1.204%	0.9	0.0011	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
90.0	1.403%	1.0	0.0123	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
95.0	5.815%	10	0.0508	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
100.0	1.131%	11	0.0988	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
105.0	1.400%	11	0.1223	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
110.0	1.435%	11	0.1253	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
115.0	1.438%	11	0.1256	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
120.0	1.446%	11	0.1264	307.7	307.7	1.0000	1.269	0.000	0.000	0.000	0.000	0.000	0.000	
125.0	1.455%	11	0.1271	355.3	404.8	355.3	1.1393	1.984	0.000	0.000	0.000	0.000	0.000	0.000
130.0	1.464%	11	0.1279	401.6	500.6	401.6	1.2465	3.084	0.000	0.000	0.000	0.000	0.000	0.000
135.0	1.474%	11	0.1287	445.3	593.7	445.3	1.3334	4.747	0.000	0.000	0.000	0.000	0.000	0.000
140.0	1.484%	11	0.1296	484.5	682.5	484.5	1.4085	7.191	0.000	0.000	0.000	0.000	0.000	0.000
150.0	1.507%	11	0.1316	548.0	844.9	548.0	1.5419	15.148	0.000	0.000	0.000	0.000	0.000	0.000
160.0	1.523%	11	0.1339	594.0	989.9	594.0	1.6665	26.424	0.000	0.000	0.000	0.000	0.000	0.000
170.0	1.563%	11	0.1365	627.7	1122.6	627.7	1.7884	36.968	0.000	0.000	0.000	0.000	0.000	0.000
180.0	1.599%	11	0.1397	653.2	1247.0	653.2	1.9092	44.319	0.000	0.000	0.000	0.000	0.000	0.000
190.0	1.645%	11	0.1437	673.0	1365.8	673.0	2.0296	49.411	0.000	0.000	0.000	0.000	0.000	0.000
200.0	1.705%	11	0.1490	688.7	1480.6	690.1	2.1454	53.595	0.000	0.000	0.000	0.000	0.000	0.000
210.0	1.802%	11	0.1574	701.5	1564.2	707.3	2.2116	57.582	0.000	0.000	0.000	0.000	0.000	0.000
220.0	2.144%	11	0.1873	712.0	1634.9	724.4	2.2569	61.669	0.000	0.000	0.000	0.000	0.000	0.000
230.0	2.476%	11	0.2163	720.7	1685.1	741.5	2.2725	65.976	0.000	0.000	0.000	0.000	0.000	0.000
240.0	3.505%	11	0.3062	727.9	1709.9	758.7	2.2538	70.560	0.000	0.000	0.000	0.000	0.000	0.000
260.0	5.972%	11	0.5217	738.8	1684.2	792.9	2.1240	80.677	0.000	0.000	0.000	0.000	0.000	0.000
280.0	8.450%	11	0.7382	746.4	1596.5	827.2	1.9300	91.858	0.000	0.000	0.000	0.000	0.000	0.000
300.0	1.031%	12	0.9004	751.7	1504.5	861.5	1.7464	98.000	0.000	0.000	0.000	0.000	0.000	0.000
320.0	1.125%	12	0.9831	755.4	1441.1	895.8	1.6087	96.168	2.618	0.291	0.033	0.033	0.033	0.033
340.0	1.144%	12	0.9992	758.1	1411.8	930.3	1.5176	92.858	6.077	0.675	0.014	0.014	0.014	0.014
360.0	1.100%	12	0.9608	760.0	1409.2	965.0	1.4603	89.608	9.205	1.023	0.000	0.000	0.000	0.000
380.0	1.002%	12	0.8757	761.4	1424.3	1000.5	1.4236	86.470	12.114	1.346	0.002	0.002	0.002	0.002
400.0	8.730%	11	0.7627	762.5	1450.1	1037.9	1.3972	83.441	14.877	1.653	0.001	0.001	0.001	0.001
420.0	7.335%	11	0.6408	763.3	1482.0	1079.1	1.3734	80.517	17.524	1.947	0.000	0.000	0.000	0.000
440.0	6.004%	11	0.5245	763.9	1517.5	1126.1	1.3476	77.692	20.517	2.230	0.000	0.000	0.000	0.000
460.0	4.834%	11	0.4223	764.3	1554.8	1178.8	1.3190	74.964	22.530	2.503	0.000	0.000	0.000	0.000
480.0	3.863%	11	0.3375	764.7	1593.3	1235.4	1.2897	72.327	24.905	2.767	0.000	0.000	0.000	0.000
500.0	3.087%	11	0.2697	765.0	1632.4	1293.8	1.2617	69.776	27.201	3.022	0.000	0.000	0.000	0.000
520.0	2.483%	11	0.2169	765.2	1671.8	1353.0	1.2356	67.307	29.424	3.269	0.000	0.000	0.000	0.000
540.0	2.019%	11	0.1763	765.4	1711.3	1412.4	1.2116	64.912	31.580	3.509	0.000	0.000	0.000	0.000
560.0	1.665%	11	0.1454	765.6	1751.0	1472.0	1.1896	62.584	33.675	3.742	0.000	0.000	0.000	0.000
580.0	1.395%	11	0.1219	765.7	1790.7	1531.5	1.1692	60.315	35.717	3.969	0.000	0.000	0.000	0.000
600.0	1.189%	11	0.1039	765.8	1830.5	1591.0	1.1505	58.095	37.715	4.191	0.000	0.000	0.000	0.000
620.0	1.031%	11	0.0901	765.9	1870.2	1650.5	1.1331	55.912	39.679	4.409	0.000	0.000	0.000	0.000
640.0	9.092%	10	0.0794	766.0	1910.0	1709.8	1.1171	53.757	41.619	4.624	0.000	0.000	0.000	0.000
660.0	8.141%	10	0.0711	766.0	1949.8	1769.0	1.1022	51.619	43.543	4.838	0.000	0.000	0.000	0.000
680.0	7.393%	10	0.0646	766.1	1989.6	1827.9	1.0885	49.490	45.459	5.051	0.000	0.000	0.000	0.000
700.0	6.802%	10	0.0594	766.1	2029.4	1886.4	1.0758	47.370	47.367	5.263	0.000	0.000	0.000	0.000
720.0	6.331%	10	0.0553	766.2	2069.2	1944.4	1.0641	45.264	49.263	5.474	0.000	0.000	0.000	0.000
740.0	5.953%	10	0.0520	766.2	2109.0	2001.8	1.0535	43.181	51.137	5.682	0.000	0.000	0.000	0.000
760.0	5.648%	10	0.0493	766.2	2148.7	2058.1	1.0440	41.137	52.977	5.886	0.000	0.000	0.000	0.000
780.0	5.400%	10	0.0472	766.3	2188.5	2113.2	1.0357	39.144	54.770	6.086	0.000	0.000	0.000	0.000
800.0	5.199%	10	0.0454	766.3	2228.3	2166.7	1.0284	37.215	56.507	6.279	0.000	0.000	0.000	0.000

W_L HLT H1= 3.0T GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH= 3 HOUR= 6.1

CALCULATED VALUES! MLAT= 21.4 MAGLA= 8.1 XHI= 90.0
 DTP= 15.9 MDIP= 15.8 SUNSET:17.9 L.T. SUN DEC.= -3.3
 SUNRISE: 6.1 L.T. NME=3.18%10 NMHD=4.00%08
 NMF2=2.52%11 HMFL= 0.00%01 HME=107.5 HMD= 84.5
 HMFL= 260.4 HME=107.5 HMD= 84.5

	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDHE+	RDD2+	RDND+
H	80.0 2.914%08	0.0012	-1	-1	-1	-1	-1	-1	-1	-1
85.0 4.081%08	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0 1.839%09	0.0073	-1	-1	-1	-1	-1	0.020	0.000	0.000	17.951
95.0 1.204%10	0.0478	-1	-1	-1	-1	0.031	0.000	0.000	0.000	82.029
100.0 2.629%10	0.1043	-1	-1	-1	-1	0.048	0.000	0.000	0.000	79.080
105.0 3.158%10	0.1253	-1	-1	-1	-1	0.074	0.000	0.000	0.000	75.722
110.0 3.054%10	0.1212	-1	-1	-1	-1	0.115	0.000	0.000	0.000	72.038
115.0 2.448%10	0.0971	-1	-1	-1	-1	0.178	0.000	0.000	0.000	68.360
120.0 1.951%10	0.0774	287.6	327.6	1.0940	0.275	0.000	0.000	0.000	0.000	65.312
125.0 1.927%10	0.0765	327.6	358.4	1.1681	0.426	0.000	0.000	0.000	0.000	63.423
130.0 2.390%10	0.0948	366.3	427.8	1.2297	0.656	0.000	0.000	0.000	0.000	62.595
135.0 3.050%10	0.1210	402.0	494.4	1.2843	1.529	0.000	0.000	0.000	0.000	62.344
140.0 3.528%10	0.1400	433.1	556.3	1.3843	2.355	0.000	0.000	0.000	0.000	62.142
145.0 4.116%10	0.1633	480.7	665.4	1.4800	6.481	0.000	0.000	0.000	0.000	61.285
150.0 4.873%10	0.1933	513.1	759.4	1.5746	10.439	0.000	0.000	0.000	0.000	59.792
170.0 5.921%10	0.2349	535.8	843.6	1.6648	14.394	0.000	0.000	0.000	0.000	60.649
180.0 7.708%10	0.3058	552.4	921.9	1.7431	18.251	0.000	0.000	0.000	0.000	59.184
190.0 1.088%11	0.4316	565.2	996.2	1.8120	22.368	0.000	0.000	0.000	0.000	71.048
200.0 1.429%11	0.5670	575.2	1067.7	1.8438	27.086	0.000	0.000	0.000	0.000	71.900
210.0 1.760%11	0.6982	583.2	1119.2	607.0	32.666	0.000	0.000	0.000	0.000	69.862
220.0 2.048%11	0.8127	589.8	1163.5	624.8	98.000	0.000	0.000	0.000	0.000	65.711
230.0 2.271%11	0.9012	595.2	1197.0	642.5	96.879	0.000	0.000	0.000	0.000	59.795
240.0 2.420%11	0.9601	599.7	1217.2	660.3	39.341	0.000	0.000	0.000	0.000	42.763
260.0 2.520%11	1.0000	606.5	1218.9	695.8	1.7518	56.992	0.000	0.000	0.000	18.321
280.0 2.470%11	0.9802	611.1	1188.5	731.3	1.6251	81.610	0.000	0.000	0.000	1.980
300.0 2.329%11	0.9241	614.4	1155.2	766.8	1.5065	98.000	0.000	0.000	0.000	0.626
320.0 2.122%11	0.8420	616.7	1135.9	802.3	1.4158	96.879	0.000	0.000	0.000	0.177
340.0 1.879%11	0.7456	618.4	1133.4	837.8	1.3528	93.557	0.626	0.002	0.000	0.244
360.0 1.627%11	0.6455	619.6	1144.2	873.2	1.3102	90.283	8.700	0.967	0.000	0.050
380.0 1.385%11	0.5497	620.4	1163.6	908.5	1.2808	87.122	11.578	1.286	0.000	0.014
400.0 1.167%11	0.4632	621.1	1188.4	943.3	1.2598	84.070	14.334	1.593	0.000	0.004
420.0 9.786%10	0.3883	621.6	1204.4	977.3	1.2323	81.123	16.988	1.888	0.000	0.001
440.0 8.201%10	0.3254	622.0	1222.2	1010.1	1.2100	78.278	19.550	2.172	0.000	0.000
460.0 6.896%10	0.2736	622.4	1241.0	1041.6	1.1915	75.529	22.024	2.447	0.000	0.000
480.0 5.839%10	0.2317	622.5	1260.3	1072.3	1.1754	72.872	24.415	2.713	0.000	0.000
500.0 4.987%10	0.1979	622.7	1280.0	1102.5	1.1609	70.302	26.728	2.970	0.000	0.000
520.0 4.306%10	0.1708	622.8	1299.8	1132.6	1.1476	67.814	28.967	3.219	0.000	0.000
540.0 3.760%10	0.1492	623.0	1319.7	1162.6	1.1351	65.401	31.139	3.460	0.000	0.000
560.0 3.322%10	0.1318	623.1	1339.6	1192.6	1.1233	63.055	33.250	3.694	0.000	0.000
580.0 2.970%10	0.1178	623.1	1359.6	1222.6	1.1121	60.769	35.308	3.923	0.000	0.000
600.0 2.686%10	0.1066	623.2	1379.6	1252.5	1.1014	58.532	37.321	4.147	0.000	0.000
620.0 2.455%10	0.0974	623.2	1399.5	1282.4	1.0914	56.334	39.300	4.367	0.000	0.000
640.0 2.267%10	0.0900	623.3	1419.5	1312.2	1.0818	54.162	41.254	4.584	0.000	0.000
660.0 2.113%10	0.0839	623.3	1439.5	1342.0	1.0727	52.008	43.193	4.799	0.000	0.000
680.0 1.987%10	0.0788	623.3	1459.5	1371.6	1.0641	49.863	45.123	5.014	0.000	0.000
700.0 1.882%10	0.0747	623.3	1479.5	1401.1	1.0560	47.727	47.046	5.227	0.000	0.000
720.0 1.795%10	0.0712	623.4	1499.5	1430.3	1.0484	45.605	45.440	5.440	0.000	0.000
740.0 1.723%10	0.0684	623.4	1519.5	1459.2	1.0414	43.507	50.844	5.649	0.000	0.000
760.0 1.663%10	0.0660	623.4	1539.5	1487.6	1.0349	41.447	49.055	5.855	0.000	0.000
780.0 1.612%10	0.0640	623.4	1559.5	1515.4	1.0291	39.439	54.505	6.025	0.000	0.000
800.0 1.569%10	0.0623	623.4	1579.5	1542.5	1.0240	37.495	56.254	6.250	0.000	0.000

WE PUT B1= 3.070 GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH= 3 HOUR= 0,0

CALCULATED VALUES: NLAT= 21.4 NLNG= 55.4
 DIP= 15.9 MDIP= 15.8 MAGLA= 8.1 XHI= 168.6
 SUNRISE: 6:1 L.T. SUNSET: 17:9 L.T. SUN DEC.= -3.3
 NMF1= 0.00% 01 TIME= 1.78%09 NMD= 4.00%08
 HMF2= 5.46%11 HMF1= 0.0 HME= 105.0 HMD= 88.0
 HMF2= 288.1

INPUT: LATI = 14.7 LONGI = 342.6 R = 10 H = 6 HURR = 12.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4 XHI= 8.4
 DIP= 15.9 MDOPP= 15.8 MAGLA= 8.1 SUN DEC= 23.1
 SUNRISE: 5.6 L.T. SUNSET: 18.4 L.T. NME= 1.47%
 NMDF= 6.36% NMFI= 2.50% NMIE= 1.47%
 HME= 110.0 HMD= 81.0 HMF= 2.34% HMEF= 244.4

	RDD0+	RDH0+	RDHE+	RDNO+
-1	-1	-1	-1	-1
-1	-1	-1	-1	-1
-1	-1	-1	-1	-1
-1	0.246	0.000	0.000	52.328
0.353	0.000	0.000	47.525	52.122
0.506	0.000	0.000	43.332	56.161
0.726	0.000	0.000	39.860	59.415
1.037	0.000	0.000	37.255	61.708
1.476	0.000	0.000	35.522	63.002
2.086	0.000	0.000	34.424	63.491
2.912	0.000	0.000	33.665	63.423
3.994	0.000	0.000	33.057	62.949
6.897	0.000	0.000	31.995	61.108
10.270	0.000	0.000	31.000	58.730
13.476	0.000	0.000	30.015	56.508
16.516	0.000	0.000	28.888	54.596
19.690	0.000	0.000	26.711	53.599
23.244	0.000	0.000	20.802	55.954
27.350	0.000	0.000	12.573	60.077
32.145	0.000	0.000	6.839	61.016
37.767	0.000	0.000	3.649	58.584
44.366	0.000	0.000	1.942	53.692
61.210	0.000	0.000	0.549	38.241
83.617	0.000	0.000	0.155	16.228
98.000	0.000	0.000	0.044	1.956
96.732	2.337	0.260	0.012	0.658
93.413	5.757	0.640	0.004	0.186
90.144	8.822	0.980	0.001	0.053
86.988	11.698	1.300	0.000	0.015
83.940	14.450	1.606	0.000	0.000
80.998	17.100	1.900	0.000	0.000
78.157	19.658	2.184	0.000	0.000
75.413	22.129	2.459	0.000	0.000
72.760	24.516	2.724	0.000	0.000
70.194	26.825	2.981	0.000	0.000
67.709	29.062	3.229	0.000	0.000
65.300	31.230	3.470	0.000	0.000
62.958	33.338	3.704	0.000	0.000
60.675	35.392	3.932	0.000	0.000
58.442	37.402	4.156	0.000	0.000
56.247	39.378	4.375	0.000	0.000
54.079	41.329	4.592	0.000	0.000
51.927	43.265	4.807	0.000	0.000
49.786	45.193	5.021	0.000	0.000
47.653	47.112	5.235	0.000	0.000
45.534	49.019	5.447	0.000	0.000
43.440	50.904	5.656	0.000	0.000
41.383	54.759	5.862	0.000	0.000
39.377	54.306	6.062	0.000	0.000

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH= 6 HOUR= 5.6

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHI= 90.0
 SUNRISE: 5.6 L.T. SUNSET: 18.4 L.T. SUN DEC.= 23.1
 NMF1= 1.30% NMF11= 0.00% NMF12= 3.17% NMF13= 23.1
 HMF2= 224.0 HMF1= 0.0 HME= 107.5 HMD= 84.5

H	NE	TN	TE	TI	TE/TI	RDN+	RDN*	RDN+	RDN*	RDN+	RDN*	RDN+	RDN*
80.0	2.914%08	0.0022	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.081%08	0.0031	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.839%09	0.0141	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.204%10	0.0923	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.626%10	0.2015	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.153%10	0.2419	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	3.050%10	0.2340	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	2.445%10	0.1876	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.948%10	0.1495	289.0	289.0	1.0000	289.0	289.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125.0	1.925%10	0.1477	329.5	360.0	329.5	360.0	368.7	429.8	368.7	429.8	368.7	429.8	368.7
130.0	2.389%10	0.1833	405.0	405.0	405.0	405.0	496.7	405.0	496.7	405.0	496.7	405.0	496.7
135.0	3.047%10	0.2338	436.6	436.6	436.6	436.6	558.9	436.6	558.9	436.6	558.9	436.6	558.9
140.0	3.987%10	0.3059	485.2	485.2	485.2	485.2	668.7	485.2	668.7	485.2	668.7	485.2	668.7
145.0	6.428%10	0.4932	582.3	582.3	582.3	582.3	1090.2	577.2	1090.2	577.2	1090.2	577.2	1090.2
150.0	8.362%10	0.6416	518.4	518.4	518.4	518.4	763.1	518.4	763.1	518.4	763.1	518.4	763.1
155.0	9.753%10	0.7483	541.7	541.7	541.7	541.7	847.6	541.7	847.6	541.7	847.6	541.7	847.6
160.0	1.287%11	0.9878	590.6	590.6	590.6	590.6	1123.1	612.2	1123.1	612.2	1123.1	612.2	1123.1
165.0	1.302%11	0.9991	597.4	597.4	597.4	597.4	1167.3	629.8	1167.3	629.8	1167.3	629.8	1167.3
170.0	1.186%11	0.9103	572.0	572.0	572.0	572.0	1090.2	577.2	1090.2	577.2	1090.2	577.2	1090.2
175.0	1.250%11	0.9593	582.3	582.3	582.3	582.3	1071.7	594.7	1071.7	594.7	1071.7	594.7	1071.7
180.0	1.094%11	0.8394	558.9	558.9	558.9	558.9	925.9	559.7	925.9	559.7	925.9	559.7	925.9
185.0	1.301%11	0.9983	603.0	603.0	603.0	603.0	1200.7	647.3	1200.7	647.3	1200.7	647.3	1200.7
190.0	1.288%11	0.9884	607.6	607.6	607.6	607.6	1220.8	664.8	1220.8	664.8	1220.8	664.8	1220.8
195.0	1.231%11	0.9445	614.6	614.6	614.6	614.6	1222.2	699.9	1222.2	699.9	1222.2	699.9	1222.2
200.0	1.140%11	0.8750	619.4	619.4	619.4	619.4	1191.4	734.9	1191.4	734.9	1191.4	734.9	1191.4
205.0	1.029%11	0.7895	622.8	622.8	622.8	622.8	1157.6	770.0	1157.6	770.0	1157.6	770.0	1157.6
210.0	6.778%10	0.4433	629.1	629.1	629.1	629.1	1137.9	805.0	1137.9	805.0	1137.9	805.0	1137.9
215.0	4.914%10	0.3770	630.2	630.2	630.2	630.2	1204.4	944.2	1204.4	944.2	1204.4	944.2	1204.4
220.0	4.183%10	0.3270	631.3	631.3	631.3	631.3	1188.4	1188.4	1188.4	1188.4	1188.4	1188.4	1188.4
225.0	3.575%10	0.2743	630.6	630.6	630.6	630.6	1134.9	840.0	1134.9	840.0	1134.9	840.0	1134.9
230.0	6.776%10	0.5199	628.1	628.1	628.1	628.1	1145.2	875.0	1145.2	875.0	1145.2	875.0	1145.2
235.0	5.778%10	0.4433	6164.1	6164.1	6164.1	6164.1	909.8	1279.6	909.8	1279.6	909.8	1279.6	909.8
240.0	4.183%10	0.3270	629.7	629.7	629.7	629.7	1102.6	1102.6	1102.6	1102.6	1102.6	1102.6	1102.6
245.0	3.575%10	0.2743	631.5	631.5	631.5	631.5	1139.6	1139.6	1139.6	1139.6	1139.6	1139.6	1139.6
250.0	3.075%10	0.2360	630.9	630.9	630.9	630.9	1241.0	1041.8	1241.0	1041.8	1241.0	1041.8	1241.0
255.0	2.667%10	0.2046	631.2	631.2	631.2	631.2	1260.3	1072.4	1260.3	1072.4	1260.3	1072.4	1260.3
260.0	2.334%10	0.1791	631.3	631.3	631.3	631.3	1280.0	1102.6	1280.0	1102.6	1280.0	1102.6	1280.0
265.0	2.064%10	0.1583	631.5	631.5	631.5	631.5	1299.8	1132.7	1299.8	1132.7	1299.8	1132.7	1299.8
270.0	1.843%10	0.1414	631.6	631.6	631.6	631.6	1319.7	1162.7	1319.7	1162.7	1319.7	1162.7	1319.7
275.0	1.663%10	0.0929	632.0	632.0	632.0	632.0	1339.6	1192.7	1339.6	1192.7	1339.6	1192.7	1339.6
280.0	1.515%10	0.0832	632.0	632.0	632.0	632.0	1359.6	1222.6	1359.6	1222.6	1359.6	1222.6	1359.6
285.0	1.394%10	0.0794	632.1	632.1	632.1	632.1	1379.6	1252.6	1379.6	1252.6	1379.6	1252.6	1379.6
290.0	1.294%10	0.0993	631.9	631.9	631.9	631.9	1399.5	1282.4	1399.5	1282.4	1399.5	1282.4	1399.5
295.0	1.211%10	0.0929	632.0	632.0	632.0	632.0	1419.5	1312.3	1419.5	1312.3	1419.5	1312.3	1419.5
300.0	1.142%10	0.0876	632.0	632.0	632.0	632.0	1439.5	1342.0	1439.5	1342.0	1439.5	1342.0	1439.5
305.0	1.084%10	0.0832	632.0	632.0	632.0	632.0	1459.5	1371.7	1459.5	1371.7	1459.5	1371.7	1459.5
310.0	1.035%10	0.0794	632.1	632.1	632.1	632.1	1479.5	1401.1	1479.5	1401.1	1479.5	1401.1	1479.5
315.0	9.947%9	0.0763	632.1	632.1	632.1	632.1	1499.5	1430.3	1499.5	1430.3	1499.5	1430.3	1499.5
320.0	9.603%9	0.0737	632.1	632.1	632.1	632.1	1519.5	1459.2	1519.5	1459.2	1519.5	1459.2	1519.5
325.0	9.312%9	0.0715	632.1	632.1	632.1	632.1	1539.5	1487.6	1539.5	1487.6	1539.5	1487.6	1539.5
330.0	9.066%9	0.0696	632.1	632.1	632.1	632.1	1559.5	1515.5	1559.5	1515.5	1559.5	1515.5	1559.5
335.0	8.856%9	0.0680	632.2	632.2	632.2	632.2	1579.5	1542.5	1579.5	1542.5	1579.5	1542.5	1579.5
WE PUT B1=	3.070	GET HST											

INPUT: LAT1= 14.7 LONG1= 342.6 R= 10 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MNIDIP= 15.8 MAGLA= 8.1 XHI= 142.2
 SUNRISE: 5.6 L.T. SUNSET: 18.4 L.T. SUN DEC.= 23.1
 NMFL1= 22%11 NMFL1= 0.00%-01 NMFL1= 1.78%09 NMFL1= 4.00%08
 NMFL2= 310.4 NMFL1= 0.0 HME= 105.0 HMD= 88.0

		TE/TI	TE	T1	TE/TI	RDH*	RDD*	RDN0+
H	NE	N/NMAX	TN	T1	-1	-1	-1	-1
80.0	5.922%05	4.8%-6	-1	-1	-1	-1	-1	-1
85.0	2.494%08	0.0020	-1	-1	-1	-1	-1	-1
90.0	4.737%08	0.0039	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0143	-1	-1	-1	0.001	0.000	0.000
100.0	1.775%09	0.0145	-1	-1	-1	0.002	0.000	0.000
105.0	1.775%09	0.0145	-1	-1	-1	0.004	0.000	0.000
110.0	1.486%09	0.0122	-1	-1	-1	0.009	0.000	0.000
115.0	9.983%08	0.0082	-1	-1	-1	0.000	0.000	0.000
120.0	6.381%08	0.0052	286.7	286.7	1.0000	0.017	0.000	0.000
125.0	4.399%08	0.0036	326.3	331.8	1.0170	0.032	0.000	0.000
130.0	3.549%08	0.0029	364.6	375.7	1.0304	0.060	0.000	0.000
135.0	3.488%08	0.0029	400.0	416.7	1.0416	0.115	0.000	0.000
140.0	4.184%08	0.0034	430.7	452.9	1.0515	0.216	0.000	0.000
145.0	9.231%08	0.0076	477.6	510.9	1.0697	0.724	0.000	0.000
150.0	1.940%09	0.0159	509.4	553.8	1.0871	2.098	0.000	0.000
155.0	2.631%09	0.0215	587.2	531.7	1.1044	4.696	0.000	0.000
160.0	3.605%09	0.0295	548.0	614.6	1.1215	7.945	0.000	0.000
165.0	5.013%09	0.0410	560.5	638.1	1.1344	11.196	0.000	0.000
170.0	7.126%09	0.0583	570.3	659.0	1.1421	14.527	0.000	0.000
175.0	1.051%10	0.0861	578.1	678.0	1.1461	18.282	0.000	0.000
180.0	1.685%10	0.1379	584.6	695.5	1.1476	22.765	0.000	0.000
185.0	2.852%10	0.2335	589.9	711.9	1.1471	28.250	0.000	0.000
190.0	4.368%10	0.3576	594.2	727.4	1.1452	35.014	0.000	0.000
195.0	7.889%10	0.6460	600.8	756.2	1.1386	53.731	0.000	0.000
200.0	1.077%11	0.8821	605.4	783.0	1.1295	81.308	0.000	0.000
205.0	1.208%11	0.9895	608.6	808.4	1.1193	98.000	0.000	0.000
210.0	1.216%11	0.9952	610.9	751.2	1.1087	86.924	11.221	1.247
215.0	1.169%11	0.9575	612.5	664.2	1.1082	74.177	23.086	2.565
220.0	1.086%11	0.8895	613.7	880.0	1.0884	63.254	33.028	3.670
225.0	9.798%10	0.8022	614.5	903.0	1.0800	53.956	41.427	4.603
230.0	8.632%10	0.7068	615.1	925.9	1.0745	46.047	48.554	5.395
235.0	7.476%10	0.6122	615.6	926.0	1.0489	39.325	54.606	6.067
240.0	6.405%10	0.5244	616.0	926.1	1.0489	33.619	59.742	6.638
245.0	5.458%10	0.4469	616.3	926.3	1.0229	28.783	64.095	7.122
250.0	4.649%10	0.3807	616.5	926.4	1.0188	24.692	67.777	7.531
255.0	3.975%10	0.3255	616.7	926.6	1.0172	21.241	70.883	7.876
260.0	3.422%10	0.2802	616.8	927.3	1.0165	18.337	73.497	8.166
265.0	2.972%10	0.2433	616.9	927.5	1.0157	15.0319	75.690	8.410
270.0	2.608%10	0.2136	617.0	927.0	1.0161	13.0229	77.837	8.614
275.0	2.315%10	0.1896	617.1	927.2	1.0155	12.144	79.071	8.786
280.0	2.079%10	0.1702	617.2	927.3	1.0158	10.701	80.369	8.930
285.0	1.418%10	0.1161	617.4	928.1	1.0153	6.044	84.560	9.396
290.0	1.887%10	0.1545	617.5	928.2	1.0157	9.478	81.470	9.052
295.0	1.154%	0.1104	617.6	928.3	1.0156	8.431	82.412	9.157
300.0	1.732%10	0.1418	617.7	928.4	1.0160	13.857	77.528	8.614
305.0	1.606%10	0.1315	617.8	928.5	1.0155	7.527	83.226	9.247
310.0	1.243%10	0.1018	617.9	928.6	1.0154	6.738	83.936	9.326
315.0	1.203%10	0.0985	617.4	928.7	1.0150	4.394	86.046	9.561
320.0	1.170%10	0.0958	617.5	928.8	1.0149	3.956	86.440	9.644

WE PUT B1= 3.0TU GET LIST

INPUT: LATI= 14.7 LONGI= 342.6 R = 10 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MNDIP= 15.8 HAGLA= 8.1 XHI= 37.6
 SUNRISE: 6:4 L.T. SUNSET:17.6 L.T. SUN DEC.: -22.9
 NMF2=1.01%12 NMFL1= 0.00%-01 HME=1.29%11 NMD=5.74%08
 HMF2=304.8 HMF1= 0.0 HME=110.0 HMD= 81.1

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDD*	RDHE+	RDD2+	RDN0+
80.0	5.577%08	5.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.111%09	0.0011	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.291%10	0.0128	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	5.314%10	0.0527	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.026%11	0.1017	-1	-1	-1	-1	0.317	0.000	0.000	67.438	32.245
105.0	1.265%11	0.1254	-1	-1	-1	-1	0.474	0.000	0.000	64.558	34.968
110.0	1.294%11	0.1284	-1	-1	-1	-1	0.707	0.000	0.000	61.789	37.504
115.0	1.296%11	0.1285	-1	-1	-1	1.055	0.000	0.000	59.106	39.839	
120.0	1.326%11	0.1315	305.9	305.9	1.0000	1.574	0.000	0.000	56.463	41.964	
125.0	1.357%11	0.1346	352.9	402.9	1.1418	2.345	0.000	0.000	53.780	43.876	
130.0	1.389%11	0.1378	398.5	498.6	1.2512	3.489	0.000	0.000	50.969	45.542	
135.0	1.423%11	0.1411	441.4	591.6	1.3401	5.178	0.000	0.000	48.020	46.802	
140.0	1.458%11	0.1446	480.0	680.1	1.4171	7.651	0.000	0.000	45.000	47.349	
150.0	1.533%11	0.1520	541.9	842.2	1.5541	16.257	0.000	0.000	38.670	45.073	
160.0	1.615%11	0.1601	586.6	987.0	1.6826	31.859	0.000	0.000	30.293	37.848	
170.0	1.704%11	0.1690	619.2	1119.6	1.8083	53.133	0.000	0.000	19.797	27.070	
180.0	1.805%11	0.1790	643.7	1244.3	1.9330	71.864	0.000	0.000	11.703	16.434	
190.0	1.918%11	0.1901	662.7	1363.4	2.0571	82.658	0.000	0.000	6.774	10.568	
200.0	2.047%11	0.2030	677.9	1478.7	2.1735	87.639	0.000	0.000	3.909	8.452	
210.0	2.201%11	0.2182	690.2	1562.1	2.2384	90.909	0.000	0.000	2.255	7.735	
220.0	2.391%11	0.2371	700.2	1632.7	2.2822	91.420	0.000	0.000	1.301	7.729	
230.0	2.651%11	0.2629	708.5	1682.8	2.2960	92.506	0.000	0.000	0.750	6.743	
240.0	3.239%11	0.3212	715.4	1707.6	2.2753	93.489	0.000	0.000	0.433	6.078	
250.0	6.490%11	0.6435	725.9	1682.0	785.6	2.1412	95.393	0.000	0.000	0.144	4.463
260.0	9.097%11	0.9021	733.2	1594.6	820.7	1.9431	97.250	0.000	0.000	0.048	2.702
270.0	1.006%12	0.9974	738.2	1502.9	855.8	1.7562	98.000	0.353	0.039	0.016	1.591
280.0	9.922%11	0.9839	741.8	1439.7	890.9	1.6160	95.827	3.274	0.364	0.005	0.529
290.0	9.922%11	0.9839	741.8	1439.7	890.9	1.6160	95.827	3.274	0.364	0.005	0.529
300.0	9.275%11	0.9197	744.4	1410.5	926.2	1.5230	92.523	6.570	0.730	0.002	0.176
310.0	8.277%11	0.8208	746.2	1408.0	961.7	1.4641	89.284	9.591	1.066	0.001	0.059
320.0	7.109%11	0.7049	747.6	1423.1	998.0	1.4260	86.158	12.440	1.382	0.000	0.020
330.0	5.926%11	0.5877	748.6	1448.9	1036.1	1.3985	83.140	15.169	1.685	0.000	0.006
340.0	4.838%11	0.4798	749.3	1480.8	1077.8	1.3739	80.226	17.795	1.977	0.000	0.002
350.0	3.900%11	0.3868	749.9	1516.1	1.3475	77.412	20.329	2.259	0.000	0.000	0.000
360.0	2.277%11	0.2820	746.2	1408.0	961.7	1.4641	89.284	9.591	1.066	0.001	0.059
370.0	7.109%11	0.7049	747.6	1423.1	998.0	1.4260	86.158	12.440	1.382	0.000	0.020
380.0	5.926%11	0.5877	748.6	1448.9	1036.1	1.3985	83.140	15.169	1.685	0.000	0.006
390.0	4.838%11	0.4798	749.3	1480.8	1077.8	1.3739	80.226	17.795	1.977	0.000	0.002
400.0	3.900%11	0.3868	749.9	1516.1	1.3475	77.412	20.329	2.259	0.000	0.000	0.000
410.0	1.378%11	0.1367	751.4	1553.4	1178.0	1.3187	74.693	22.776	2.531	0.000	0.000
420.0	3.129%11	0.3103	750.4	1591.7	1234.5	1.2894	72.066	25.141	2.793	0.000	0.000
430.0	2.514%11	0.2493	750.7	1591.7	1234.5	1.2894	72.066	25.141	2.793	0.000	0.000
440.0	8.613%10	0.0854	751.0	1630.7	1292.8	1.2613	69.524	27.428	3.048	0.000	0.000
450.0	1.663%11	0.1649	751.2	1670.0	1351.9	1.2353	67.064	29.643	3.294	0.000	0.000
460.0	3.129%11	0.3868	749.9	1516.1	1.3475	77.412	20.329	2.259	0.000	0.000	0.000
470.0	1.160%11	0.1150	751.6	1749.1	1470.6	1.1893	62.358	33.878	3.764	0.000	0.000
480.0	9.916%10	0.0983	751.7	1788.7	1825.7	1.1691	60.097	35.913	3.990	0.000	0.000
490.0	5.669%10	0.0562	751.8	1828.4	1589.4	1.1503	57.885	37.904	4.212	0.000	0.000
500.0	8.613%10	0.0425	751.2	1670.0	1351.9	1.2353	67.064	29.643	3.294	0.000	0.000
510.0	7.598%10	0.0753	751.9	1868.0	1648.7	1.1330	55.710	39.861	4.429	0.000	0.000
520.0	4.941%10	0.0490	751.4	1709.5	1411.2	1.2114	64.677	31.791	3.532	0.000	0.000
530.0	6.801%10	0.0674	751.9	1907.7	1707.9	1.1170	53.563	41.793	4.644	0.000	0.000
540.0	6.171%10	0.0612	752.0	1947.4	1766.9	1.1021	51.432	43.711	4.857	0.000	0.000
550.0	5.669%10	0.0562	752.0	1987.1	1825.7	1.0884	49.311	45.620	5.069	0.000	0.000
560.0	5.266%10	0.0522	752.1	2026.8	1884.1	1.0757	47.199	47.521	5.280	0.000	0.000
570.0	4.941%10	0.0490	752.1	2066.5	1942.0	1.0641	45.100	49.410	5.490	0.000	0.000
580.0	4.677%10	0.0464	752.2	2106.2	1999.2	1.0535	43.025	51.277	5.697	0.000	0.000
590.0	4.461%10	0.0442	752.2	2145.9	2055.4	1.0440	40.988	53.110	5.901	0.000	0.000
600.0	4.285%10	0.0425	752.2	2185.6	2110.4	1.0356	39.003	54.897	6.100	0.000	0.000
610.0	4.139%10	0.0410	752.2	2225.3	2163.8	1.0284	37.080	56.628	6.292	0.000	0.000

WE PUT 81= 3.0 TD GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH=12 HOUR= 6.4

CALCULATED VALUES: MLAT= 21.4 MAGLA= 8.1 XHI= 90.0
 DIP= 15.9 MODIP= 15.8 SUNSET=17.6 L.T. SUN DEC.= -22.9
 SUNRISE: 6.4 L.T. NME=3.20% HMD=4.00%
 NMF2=2.20% HMF1= 0.00% HME=107.5 HMD= 84.5
 HMF2=266.3 HMF1= 0.0 HME=107.5 HMD= 84.5

	NE	N/HMAX	TN	TE	T1	TE/T1	RDO+	RDO*	RDH+	RDH*	RDN0+	RDN0*
H	80.0	2.914%08	0.00013	-1	-1	-1	-1	-1	-1	-1	-1	-1
	85.0	4.081%08	0.00019	-1	-1	-1	-1	-1	-1	-1	-1	-1
	90.0	1.839%09	0.0084	-1	-1	-1	-1	-1	-1	-1	-1	-1
	95.0	1.207%10	0.0549	-1	-1	-1	-1	-1	-1	-1	-1	-1
	100.0	2.643%10	0.1202	-1	-1	-1	-1	-1	-1	-1	-1	-1
	105.0	3.179%10	0.1446	-1	-1	-1	-1	-1	-1	-1	-1	-1
	110.0	3.073%10	0.1398	-1	-1	-1	-1	-1	-1	-1	-1	-1
	115.0	2.454%10	0.1116	-1	-1	-1	-1	-1	-1	-1	-1	-1
	120.0	1.947%10	0.0886	288.1	288.1	1.0000	0.044	0.000	0.000	0.000	31.698	68.258
	125.0	1.923%10	0.0875	328.2	358.8	1.0934	0.084	0.000	0.000	0.000	36.294	63.021
	130.0	2.398%10	0.1090	367.0	428.3	367.0	1.1670	0.006	0.000	0.000	20.399	79.595
	135.0	3.069%10	0.1396	402.9	494.9	402.9	1.2282	0.012	0.000	0.000	23.675	76.313
	140.0	3.366%10	0.1531	434.2	556.8	434.2	1.2823	0.023	0.000	0.000	27.442	72.535
	150.0	3.670%10	0.1669	482.1	666.0	482.1	1.3815	0.079	0.000	0.000	41.880	65.041
	160.0	4.024%10	0.1831	514.7	759.9	514.7	1.4764	0.161	0.000	0.000	40.716	59.122
	170.0	4.448%10	0.2024	537.6	844.1	537.6	1.5701	0.308	0.000	0.000	43.939	55.753
	180.0	4.979%10	0.2265	554.4	922.2	554.4	1.6600	0.586	0.000	0.000	45.000	54.414
	190.0	5.701%10	0.2594	567.3	996.3	573.2	1.7381	0.925	0.000	0.000	41.880	56.445
	200.0	7.034%10	0.3200	577.4	1067.8	590.9	1.8069	1.079	0.000	0.000	36.631	56.445
	210.0	1.039%11	0.4729	585.5	1119.2	608.6	1.8390	1.281	0.000	0.000	30.703	49.590
	220.0	1.395%11	0.6345	592.2	1163.5	626.3	1.8578	1.573	0.000	0.000	21.641	36.377
	230.0	1.716%11	0.7808	597.6	1197.0	644.0	1.8587	1.875	0.000	0.000	10.559	25.306
	240.0	1.964%11	0.8934	602.1	1217.2	661.7	1.8396	1.452	0.000	0.000	4.137	18.718
	250.0	2.188%11	0.9956	609.0	1218.9	697.1	1.7487	1.746	0.000	0.000	1.545	14.973
	260.0	2.188%11	0.9956	613.7	1188.5	732.4	1.6227	1.617	0.000	0.000	0.573	12.730
	280.0	2.177%11	0.9902	617.0	1155.2	767.8	1.5046	1.5046	0.000	0.000	0.212	11.022
	300.0	2.076%11	0.9445	619.3	1135.9	803.2	1.4143	1.4143	0.000	0.000	0.079	9.469
	320.0	1.912%11	0.8697	619.3	1133.4	838.5	1.3517	1.3517	0.000	0.000	0.011	6.413
	340.0	1.709%11	0.7774	621.0	1144.2	873.8	1.3095	1.3095	0.000	0.000	0.001	3.381
	360.0	1.491%11	0.6784	622.2	1163.6	908.9	1.2803	1.2803	0.000	0.000	0.000	2.000
	380.0	1.279%11	0.5816	623.1	1188.4	943.6	1.2594	1.2594	0.000	0.000	0.000	0.290
	400.0	1.083%11	0.4927	623.7	1188.4	973.6	1.2321	1.2321	0.000	0.000	0.000	0.000
	420.0	9.118%10	0.4148	624.2	1204.4	977.5	1.1767	1.1767	0.000	0.000	0.000	0.000
	440.0	7.665%10	0.3487	624.6	1222.0	1010.2	1.2099	1.2099	0.000	0.000	2.256	0.000
	460.0	6.461%10	0.2939	624.9	1241.0	1041.6	1.1914	1.1914	0.000	0.000	2.528	0.000
	480.0	5.478%10	0.2492	625.1	1260.3	1072.3	1.1754	1.1754	0.000	0.000	2.790	0.000
	500.0	4.684%10	0.2131	625.3	1280.0	1102.5	1.1609	1.1609	0.000	0.000	3.045	0.000
	520.0	4.046%10	0.1841	625.5	1299.8	1132.6	1.1476	1.1476	0.000	0.000	3.291	0.000
	540.0	3.534%10	0.1608	625.6	1319.7	1162.6	1.1351	1.1351	0.000	0.000	3.530	0.000
	560.0	3.123%10	0.1421	625.7	1339.6	1192.6	1.1232	1.1232	0.000	0.000	3.762	0.000
	580.0	2.792%10	0.1270	625.8	1359.6	1222.6	1.1120	1.1120	0.000	0.000	3.988	0.000
	600.0	2.524%10	0.1148	625.9	1379.5	1252.5	1.1014	1.1014	0.000	0.000	4.209	0.000
	620.0	2.307%10	0.1050	626.0	1399.5	1132.6	1.0914	1.0914	0.000	0.000	4.427	0.000
	640.0	2.131%10	0.0969	626.1	1419.5	1312.2	1.0818	1.0818	0.000	0.000	4.641	0.000
	660.0	1.986%10	0.0903	626.0	1439.5	1342.0	1.0727	1.0727	0.000	0.000	4.855	0.000
	680.0	1.867%10	0.0849	626.0	1459.5	1371.6	1.0641	1.0641	0.000	0.000	5.067	0.000
	700.0	1.768%10	0.0804	626.0	1479.5	1401.1	1.0560	1.0560	0.000	0.000	5.278	0.000
	720.0	1.687%10	0.0767	626.1	1499.5	1430.3	1.0484	1.0484	0.000	0.000	5.488	0.000
	740.0	1.619%10	0.0736	626.1	1519.5	1459.2	1.0414	1.0414	0.000	0.000	5.696	0.000
	760.0	1.562%10	0.0711	626.1	1539.5	1487.6	1.0349	1.0349	0.000	0.000	5.899	0.000
	780.0	1.514%10	0.0689	626.1	1559.5	1515.4	1.0291	1.0291	0.000	0.000	6.098	0.000
	800.0	1.474%10	0.0671	626.1	1579.5	1542.5	1.0240	1.0240	0.000	0.000	6.290	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R= 10 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHI= 171.8
 SUNRSEI: 6.4 L.T. SUNSET: 17.6 L.T. SUN DEC. = -22.9
 NMFL= 3.68%11 NMFL= 0.00%-01 NMFL= 1.78%09 NMFL= 4.00%08
 HMFL= 269.0 HMFL= 0.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDH+	RDHE+	RDO2+	RDNO+
80.0	5.271%05	1.4% -6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.469%08	6.7% -4	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.727%08	0.0013	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0047	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0048	-1	-1	-1	0.003	0.000	0.000	17.568	82.429
105.0	1.775%09	0.0048	-1	-1	-1	0.000	0.000	0.000	20.399	79.594
110.0	1.485%09	0.0040	-1	-1	-1	0.012	0.000	0.000	23.675	76.312
115.0	9.960%08	0.0027	-1	-1	-1	0.024	0.000	0.000	27.442	72.535
120.0	6.356%08	0.0017	284.3	284.3	284.3	0.045	0.000	0.000	31.698	68.256
125.0	4.373%08	0.0012	323.0	323.0	323.0	0.086	0.000	0.000	36.294	63.619
130.0	3.521%08	9.6% -4	360.5	372.1	360.5	0.165	0.000	0.000	40.716	59.118
135.0	3.454%08	9.4% -4	395.0	412.3	395.0	0.316	0.000	0.000	43.939	55.745
140.0	4.138%08	0.0011	424.8	447.9	424.8	1.0545	0.601	0.000	45.000	54.399
150.0	9.132%08	0.0025	470.0	504.7	470.0	1.0739	2.132	0.000	41.880	55.987
160.0	2.894%09	0.0079	500.4	546.7	500.4	1.0925	7.103	0.000	36.631	56.267
170.0	1.399%10	0.0381	521.7	579.5	521.7	1.1109	20.214	0.000	30.703	49.083
180.0	3.456%10	0.0940	537.2	606.6	537.5	1.1286	43.062	0.000	21.641	35.296
190.0	6.565%10	0.1786	549.0	630.0	552.4	1.1405	65.582	0.000	10.559	23.859
200.0	1.099%11	0.2988	558.3	650.8	567.3	1.1473	79.133	0.000	4.137	16.730
210.0	1.644%11	0.4471	565.7	669.9	582.2	1.1505	85.634	0.000	1.545	12.821
220.0	2.228%11	0.6060	571.8	687.5	597.2	1.1514	88.935	0.000	0.573	10.492
230.0	2.772%11	0.7539	576.8	704.1	612.1	1.1503	91.059	0.000	0.212	8.729
240.0	3.207%11	0.8723	580.9	719.8	627.0	1.1480	92.792	0.000	0.079	7.129
260.0	3.642%11	0.9907	587.2	749.2	656.8	1.1406	96.005	0.000	0.000	3.984
280.0	3.651%11	0.9932	591.5	776.7	686.7	1.1311	99.071	0.000	0.001	0.927
300.0	3.488%11	0.9487	594.5	802.8	716.5	1.1205	98.000	1.384	0.154	0.462
320.0	3.205%11	0.8718	596.7	828.1	746.3	1.1097	85.862	12.667	1.407	0.000
340.0	2.849%11	0.7750	598.2	852.8	775.9	1.0991	73.253	24.065	2.674	0.000
360.0	2.466%11	0.6707	599.3	877.0	805.2	1.0892	62.465	33.780	3.753	0.000
380.0	2.092%11	0.5690	600.1	901.0	833.6	1.0809	53.283	42.045	4.672	0.000
400.0	1.751%11	0.4762	600.7	924.7	859.8	1.0795	45.473	49.074	5.453	0.000
420.0	1.454%11	0.3956	601.2	924.8	881.5	1.0491	38.835	55.048	6.116	0.000
440.0	1.206%11	0.3280	601.5	924.8	896.5	1.0316	33.200	60.120	6.680	0.000
460.0	1.002%11	0.2727	601.8	924.9	904.7	1.0223	28.424	64.418	7.158	0.000
480.0	8.387%10	0.2281	602.0	925.0	908.4	1.0182	24.384	68.054	7.562	0.000
500.0	7.080%10	0.1926	602.2	925.0	910.0	1.0165	20.976	71.121	7.902	0.000
520.0	6.042%10	0.1644	602.3	925.1	910.6	1.0159	18.109	73.702	8.189	0.000
540.0	5.220%10	0.1420	602.4	925.1	910.9	1.0156	15.702	75.868	8.430	0.000
560.0	4.567%10	0.1242	602.5	925.2	911.1	1.0155	13.685	77.684	8.632	0.000
580.0	4.047%10	0.1101	602.6	925.3	911.2	1.0154	11.992	79.207	8.801	0.000
600.0	3.630%10	0.0988	602.6	925.3	911.4	1.0153	10.567	80.489	8.943	0.000
620.0	3.295%10	0.0896	602.7	925.4	911.5	1.0153	9.359	81.577	9.064	0.000
640.0	3.025%10	0.0823	602.7	925.5	911.6	1.0153	8.326	82.507	9.167	0.000
660.0	2.805%10	0.0763	602.7	925.5	911.7	1.0152	7.433	83.010	9.257	0.000
680.0	2.625%10	0.0714	602.8	925.6	911.7	1.0152	6.654	84.011	9.335	0.000
700.0	2.477%10	0.0674	602.8	925.7	911.8	1.0152	5.969	84.628	9.403	0.000
720.0	2.355%10	0.0641	602.8	925.7	911.9	1.0151	5.362	85.174	9.464	0.000
740.0	2.254%10	0.0613	602.8	925.8	912.0	1.0151	4.822	85.660	9.518	0.000
760.0	2.170%10	0.0590	602.9	925.9	912.1	1.0150	4.339	86.095	9.566	0.000
780.0	2.099%10	0.0571	602.9	925.9	912.2	1.0150	3.906	86.484	9.609	0.000
800.0	2.041%10	0.0555	602.9	926.0	912.3	1.0150	3.518	86.834	9.648	0.000
WE PUT B1#	3.0TD GET HST									

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH= 3 HJUR=12.0

CALCULATED VALUES! MLAT= 21.6 MLNG= 55.4 XH1= 18.0
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 SUN DEC.= -3.3
 SUNRISE: 6.1 L.T. SUNSET: 17.9 L.T. NHD= 1.32%09
 NMF1= 1.99%12 NMF1= 3.59%11 NME= 1.85%11 HMD= 81.0
 HMF2= 390.7 HMF1= 272.6 HME= 110.0 HMD= 81.0

			TE/TI	RDD+	RDH+	RDO+	RDHE+	RDH0+	RDNO+
H	NE	N/NMAX	TN	TI	-1	-1	-1	-1	-1
80.0	1.286%09	6.4%	-1	-1	-1	-1	-1	-1	-1
85.0	2.579%09	0.0013	-1	-1	-1	-1	-1	-1	-1
90.0	2.783%10	0.0140	-1	-1	-1	-1	-1	-1	-1
95.0	9.651%10	0.0484	-1	-1	0.323	0.000	0.000	0.000	16.857
100.0	1.603%11	0.0803	-1	-1	0.489	0.000	0.000	0.000	23.395
105.0	1.832%11	0.0918	-1	-1	0.741	0.000	0.000	0.000	29.364
110.0	1.852%11	0.0928	-1	-1	1.120	0.000	0.000	0.000	34.832
115.0	1.855%11	0.0930	-1	-1	1.694	0.000	0.000	0.000	39.896
120.0	1.864%11	0.0934	338.6	338.6	2.557	0.000	0.000	0.000	44.627
125.0	1.872%11	0.0939	398.0	398.0	3.853	0.000	0.000	0.000	48.894
130.0	1.882%11	0.0943	456.0	527.8	5.784	0.000	0.000	0.000	52.301
135.0	1.891%11	0.0948	512.1	619.8	8.629	0.000	0.000	0.000	54.371
140.0	1.901%11	0.0953	564.7	708.4	18.491	0.000	0.000	0.000	52.855
150.0	1.923%11	0.0964	656.8	872.3	35.617	0.000	0.000	0.000	42.208
160.0	1.946%11	0.0976	730.9	1018.2	35.931	0.000	0.000	0.000	22.008
170.0	1.972%11	0.0989	789.7	1148.9	56.728	0.000	0.000	0.000	16.323
180.0	2.001%11	0.1003	836.9	1267.9	73.158	0.000	0.000	0.000	11.338
190.0	2.033%11	0.1019	875.1	1378.0	81.949	0.000	0.000	0.000	10.443
200.0	2.069%11	0.1037	906.6	1481.2	86.077	0.000	0.000	0.000	5.069
210.0	2.110%11	0.1058	932.6	1564.8	88.265	0.000	0.000	0.000	3.374
220.0	2.159%11	0.1082	954.2	1635.5	99.763	0.000	0.000	0.000	2.246
230.0	2.218%11	0.1112	972.3	1685.7	91.034	0.000	0.000	0.000	1.495
240.0	2.294%11	0.1150	987.3	1710.4	92.239	0.000	0.000	0.000	6.766
250.0	2.809%11	0.1408	1010.4	1684.7	94.629	0.000	0.000	0.000	8.854
260.0	4.714%11	0.2363	1026.5	1597.0	96.983	0.000	0.000	0.000	8.361
280.0	8.451%11	0.4236	1037.7	1504.9	98.000	0.023	0.023	0.000	2.821
300.0	1.266%12	0.6346	1045.7	1441.5	95.844	0.033	0.033	0.000	1.687
320.0	1.635%12	0.8198	1051.4	1412.1	92.539	6.402	0.711	0.017	7.471
340.0	1.879%12	0.9421	1055.5	1409.4	1061.0	1.3283	9.491	1.055	4.931
360.0	1.984%12	0.9944	1058.6	1424.4	1070.6	1.3305	86.173	1.376	2.821
380.0	1.982%12	0.9935	1060.8	1450.1	1084.0	1.3378	83.154	15.134	0.029
400.0	1.950%12	0.9935	1066.2	1451.5	1045.8	1.3408	80.240	17.772	0.001
420.0	1.873%12	0.9388	1062.5	1482.0	1105.3	1.3409	92.539	6.402	0.017
440.0	1.679%12	0.8415	1063.8	1517.5	1138.7	1.3327	77.425	20.312	0.000
460.0	1.439%12	0.7212	1064.8	1554.8	1184.0	1.3133	74.706	22.762	0.000
480.0	1.190%12	0.5965	1065.6	1593.3	1237.2	1.2879	72.078	25.128	0.000
500.0	9.590%11	0.4807	1066.2	1294.2	1293.4	1.2612	69.536	27.417	0.000
520.0	7.603%11	0.3811	1066.7	1482.0	1167.9	1.2357	67.075	29.632	0.000
540.0	5.982%11	0.2999	1067.1	1507.7	1471.7	1.2118	64.688	31.781	0.000
560.0	4.706%11	0.2359	1067.5	1751.0	1768.6	1.1733	62.368	33.868	0.000
580.0	3.724%11	0.1867	1067.7	1531.2	1695	1.1695	60.107	35.904	0.000
600.0	2.979%11	0.1493	1067.9	1830.0	1590.7	1.1507	57.895	37.895	0.000
620.0	2.415%11	0.1211	1068.1	1870.2	1650.1	1.1334	55.720	39.852	0.000
640.0	1.990%11	0.0998	1068.3	1910.0	1709.4	1.1173	53.572	41.785	0.000
660.0	1.668%11	0.0836	1068.4	1949.8	1768.6	1.1025	51.441	43.703	0.000
680.0	1.422%11	0.0713	1068.5	1989.6	1827.5	1.0887	49.320	45.612	0.000
700.0	1.232%11	0.0618	1068.6	2029.4	1886.1	1.0760	47.207	47.54	0.000
720.0	1.086%11	0.0544	1068.7	2069.2	1944.1	1.0643	45.108	49.403	0.000
740.0	9.707%10	0.0487	1068.8	2109.0	2001.4	1.0537	43.033	51.270	0.000
760.0	8.800%10	0.0441	1068.8	2148.7	2057.8	1.0442	40.996	53.104	0.000
780.0	8.077%10	0.0405	1068.9	2188.5	2112.8	1.0358	39.010	54.891	0.000
800.0	7.498%10	0.0376	1068.9	2228.3	2166.4	1.0286	37.087	56.622	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH= 3 HOUR= 6.1

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 HAGLA= 8.1 XHI= 90.0
 SUNRISE: 6.1 L.T. SUNSET:17.9 L.T. SUN DEC.= -3.3
 NMFL= 5.6911 NMFL= 0.00% NMFL= 4.00% NMFL= 84.5
 HMF2= 295.4 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	TN	TE	TI	TE/TI	R00*	RDHE*	RD02*	RDND*
80.0	2.914%08	5.1%-4	-1	-1	-1	-1	-1	-1	-1
85.0	4.081%08	7.2%-4	-1	-1	-1	-1	-1	-1	-1
90.0	1.845%09	0.0032	-1	-1	-1	-1	-1	-1	-1
95.0	1.313%10	0.0231	-1	-1	-1	-1	-1	-1	-1
100.0	3.196%10	0.0562	-1	-1	-1	-1	-1	-1	-1
105.0	4.061%10	0.0713	-1	-1	-1	-1	-1	-1	-1
110.0	3.942%10	0.0693	-1	-1	-1	-1	-1	-1	-1
115.0	3.160%10	0.0555	-1	-1	-1	-1	-1	-1	-1
120.0	2.518%10	0.0442	319.7	319.7	1.00000	0.079	0.000	0.000	0.000
125.0	2.488%10	0.0437	371.9	394.5	1.0607	0.127	0.000	0.000	0.000
130.0	3.085%10	0.0542	422.8	467.9	1.1067	0.205	0.000	0.000	0.000
135.0	3.937%10	0.1589	471.3	539.0	1.1436	0.330	0.000	0.000	0.000
140.0	4.522%10	0.0794	515.7	605.9	1.1750	0.531	0.000	0.000	0.000
150.0	5.629%10	0.0989	589.7	725.1	1.2296	1.367	0.000	0.000	0.000
160.0	7.079%10	0.1244	645.6	826.1	1.2796	3.445	0.000	0.000	0.000
170.0	9.043%10	0.1589	687.8	913.5	1.3281	8.203	0.000	0.000	0.000
180.0	1.187%11	0.2086	720.3	991.1	1.3759	17.131	0.000	0.000	0.000
190.0	1.630%11	0.2863	746.0	1061.9	1.4235	28.861	0.000	0.000	0.000
200.0	2.169%11	0.3810	766.6	1127.6	1.4709	39.219	0.000	0.000	0.000
210.0	2.757%11	0.4842	783.5	1179.0	1.5049	46.750	0.000	0.000	0.000
220.0	3.359%11	0.5900	797.4	1222.5	1.5332	52.653	0.000	0.000	0.000
230.0	3.939%11	0.6919	808.9	1254.6	1.5511	58.085	0.000	0.000	0.000
240.0	4.462%11	0.7838	818.4	1273.0	1.5552	63.627	0.000	0.000	0.000
260.0	5.243%11	0.9211	833.0	1269.9	1.5165	75.922	0.000	0.000	0.000
280.0	5.624%11	0.9879	843.1	1233.6	1.4407	89.982	0.000	0.000	0.000
300.0	5.686%11	0.989	850.2	1193.7	1.3640	98.000	0.000	0.000	0.000
320.0	5.526%11	0.9707	855.2	1167.2	1.3056	96.290	0.000	0.000	0.000
340.0	5.177%11	0.9095	858.7	1157.2	1.2675	92.980	0.000	0.000	0.000
360.0	4.694%11	0.8247	861.3	1160.2	932.0	1.2448	89.726	0.000	0.000
380.0	4.139%11	0.7271	863.2	1171.7	951.4	1.2315	86.584	12.058	1.340
400.0	3.567%11	0.6266	864.6	1188.4	971.6	1.2231	83.550	14.800	1.644
420.0	3.021%11	0.5307	865.7	1204.4	993.5	1.2123	80.622	17.439	1.938
440.0	2.529%11	0.4442	866.5	1222.2	1017.9	1.2007	77.794	19.985	2.221
460.0	2.102%11	0.3693	867.1	1241.0	1044.9	1.1877	75.062	22.444	2.494
480.0	1.744%11	0.3063	867.6	1260.3	1073.5	1.1740	72.422	24.820	2.758
500.0	1.449%11	0.2545	868.0	1280.0	1103.0	1.1605	69.868	27.119	3.013
520.0	1.209%11	0.2124	868.3	1299.8	1132.7	1.1475	67.395	29.345	3.261
540.0	1.017%11	0.1786	868.6	1319.7	1162.6	1.1351	64.997	31.503	3.500
560.0	8.630%10	0.1516	868.8	1339.6	1192.6	1.1233	62.666	33.601	3.733
580.0	7.400%10	0.1300	869.0	1359.6	1222.5	1.1121	60.394	35.646	3.961
600.0	6.417%10	0.1127	869.1	1379.6	1252.4	1.1015	58.171	37.646	4.183
620.0	5.628%10	0.0989	869.2	1399.5	1282.3	1.0914	55.986	39.613	4.401
640.0	4.992%10	0.0877	869.3	1419.5	1312.1	1.0818	53.828	41.555	4.617
660.0	4.478%10	0.0787	869.4	1439.5	1341.9	1.0728	51.686	43.482	4.831
680.0	4.059%10	0.0713	869.5	1459.5	1371.5	1.0642	49.555	45.401	5.045
700.0	3.717%10	0.0653	869.5	1479.5	1401.0	1.0561	47.432	47.311	5.257
720.0	3.435%10	0.0603	869.6	1499.5	1430.2	1.0485	45.233	49.209	5.468
740.0	3.202%10	0.0563	869.6	1519.5	1459.1	1.0414	43.238	51.086	5.676
760.0	3.009%10	0.0529	869.7	1539.5	1487.5	1.0350	41.191	52.928	5.881
780.0	2.847%10	0.0500	869.7	1559.5	1515.3	1.0292	39.196	54.724	6.080
800.0	2.711%10	0.0476	869.7	1579.5	1542.4	1.0241	37.263	56.463	6.274

WE PUT B1= 3.0 TO GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHII= 168.6
 SUNRISE: 6.1 L.T. SUNSET: 17.9 L.T. SUN DEC. = -3.3
 NMF1= 1.77%12 NMF1= 0.00%-01 NMF=3.20%09 NMDF=4.00%08
 HMF2=309.4 HMF1= 0.0 HME=105.0 HMD= 88.0

		TN	TE	TI	TE/TI	RDD+	RDH*	RDU2+	RDN0+
H	NE	N/NMAX	-1	-1	-1	-1	-1	-1	-1
80.0	5.478%05	3.1% -7	-1	-1	-1	-1	-1	-1	-1
85.0	2.477%08	1.4% -4	-1	-1	-1	-1	-1	-1	-1
90.0	4.730%08	2.7% -4	-1	-1	-1	-1	-1	-1	-1
95.0	2.509%09	0.0014	-1	-1	-1	0.012	0.000	0.000	18.284
100.0	3.193%09	0.0018	-1	-1	-1	0.019	0.000	0.000	81.704
105.0	3.201%09	0.0018	-1	-1	-1	0.031	0.000	0.000	21.005
110.0	2.678%09	0.0015	-1	-1	-1	0.050	0.000	0.000	78.976
115.0	1.797%09	0.0010	-1	-1	-1	0.081	0.000	0.000	75.900
120.0	1.148%09	6.5% -4	316.6	316.6	316.6	1.0000	0.000	0.000	72.552
125.0	0.7902%08	4.5% -4	367.6	367.6	367.6	1.0043	0.131	0.000	69.189
130.0	0.3666%08	3.6% -4	417.2	420.4	417.2	1.0076	0.210	0.000	66.305
135.0	0.6249%08	3.5% -4	464.4	469.2	464.4	1.0103	0.339	0.000	64.318
140.0	0.7489%08	4.2% -4	507.4	513.8	507.4	1.0125	0.545	0.000	63.159
145.0	0.3153%09	9.3% -4	578.6	588.2	578.6	1.0165	1.402	0.000	62.455
150.0	0.6.808%10	0.0385	631.8	644.5	631.8	1.0201	3.534	0.000	61.037
155.0	0.1.330%11	0.0752	671.6	687.5	671.6	1.0236	8.414	0.000	60.549
160.0	0.2.120%11	0.1198	702.1	721.2	702.1	1.0271	17.572	0.000	59.558
165.0	0.3.185%11	0.1800	726.1	748.3	726.1	1.0306	29.604	0.000	59.558
170.0	0.4.530%11	0.2561	745.3	770.7	745.3	1.0341	40.230	0.000	59.558
175.0	0.6.124%11	0.3462	761.0	789.6	761.0	1.0375	47.955	0.000	59.558
180.0	0.7.899%11	0.4465	773.9	805.6	773.9	1.0410	54.012	0.000	59.558
185.0	0.9.758%11	0.5516	784.6	819.5	784.6	1.0445	59.586	0.000	59.558
190.0	0.1.159%12	0.6552	793.4	821.5	793.4	1.0480	65.274	0.000	59.558
195.0	0.1.475%12	0.8338	806.9	851.4	806.9	1.0549	77.893	0.000	59.558
200.0	0.1.678%12	0.9488	816.3	867.1	816.3	1.0584	92.268	0.000	59.558
205.0	0.1.762%12	0.9959	822.8	880.0	831.4	1.0584	98.000	0.925	0.000
210.0	0.1.756%12	0.9926	827.5	890.9	843.6	1.0562	86.243	1.103	0.000
215.0	0.1.666%12	0.9420	830.8	900.6	855.7	1.0525	73.584	1.130	0.000
220.0	0.1.510%12	0.8535	833.1	909.3	867.7	1.0480	62.748	1.130	0.000
225.0	0.1.314%12	0.7427	834.9	917.4	879.3	1.0434	53.525	1.149	0.000
230.0	0.1.105%12	0.6249	836.2	925.1	890.0	1.0395	45.679	1.149	0.000
235.0	0.1.060%11	0.5122	837.2	925.2	898.9	1.0292	39.011	1.071	0.000
240.0	0.7.286%11	0.4119	837.9	925.3	905.1	1.0223	33.351	1.071	0.000
245.0	0.5.791%11	0.3274	838.5	925.3	908.5	1.0185	28.553	1.071	0.000
250.0	0.4.578%11	0.2588	839.0	925.4	910.1	1.0168	24.495	1.071	0.000
255.0	0.3.620%11	0.2046	839.3	925.5	911.8	1.0161	21.071	1.071	0.000
260.0	0.2.876%11	0.1626	839.6	925.6	911.2	1.0158	18.191	1.071	0.000
265.0	0.2.304%11	0.1303	839.9	925.7	911.4	1.0157	15.773	1.071	0.000
270.0	0.1.756%10	0.1056	840.5	926.1	912.0	1.0154	12.423	1.071	0.000
275.0	0.1.867%11	0.0867	840.1	926.2	912.2	1.0153	8.461	1.071	0.000
280.0	0.1.533%11	0.0867	840.7	926.3	911.6	1.0156	13.746	1.071	0.000
285.0	0.1.277%11	0.0722	840.3	926.0	911.9	1.0155	12.047	1.071	0.000
290.0	0.1.079%11	0.0610	840.5	926.1	912.0	1.0152	10.615	1.071	0.000
295.0	0.9.259%10	0.0523	840.5	926.2	912.2	1.0153	8.364	1.071	0.000
300.0	0.8.058%10	0.0455	840.6	926.3	912.3	1.0155	7.467	1.071	0.000
305.0	0.7.110%10	0.0402	840.7	926.4	912.5	1.0152	6.684	1.071	0.000
310.0	0.6.356%10	0.0359	840.7	926.5	912.6	1.0152	5.996	1.071	0.000
315.0	0.5.752%10	0.0325	840.8	926.6	912.7	1.0151	5.386	1.071	0.000
320.0	0.5.263%10	0.0298	840.8	926.6	912.9	1.0151	4.844	1.071	0.000
325.0	0.4.865%10	0.0275	840.9	926.7	913.0	1.0150	4.359	1.071	0.000
330.0	0.4.539%10	0.0257	840.9	926.8	913.2	1.0149	3.924	1.071	0.000
335.0	0.4.271%10	0.0241	840.9	926.9	913.3	1.0149	3.534	1.071	0.000
WE PUT BI= 3.070 GET HST									

INPUT: LATI= 14.7 LONGI= 342.6 RE=100 MONTH= 6 HOUR=12.0

CALCULATED VALUES: NLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XWI= 8.4
 SUNRISE: 5.6 L.T. SUNSET: 18.4 L.T. SUN DEC.= 23.1
 NMF2=1.26%12 NMFL= 3.63%11 NAME=1.89%11 NMD=1.34%09
 HMF2=397.1 HMF1=262.0 HME=110.0 HMD= 81.0

H	N	E	TN	TE	TI	TE/TI	RDD+	RDD2+	RDH+	RDE+	RDN0+
80.0	1.302%09	0.0010	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.626%09	0.0021	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.835%10	0.00225	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	9.840%10	0.0782	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.637%11	0.1301	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.873%11	0.1489	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.894%11	0.1505	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.907%11	0.1515	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.920%11	0.1526	339.2	339.2	339.2	1.0000	1.415	0.000	0.000	0.000	35.652
125.0	1.935%11	0.1538	398.8	434.5	457.0	528.5	457.0	1.1563	2.024	0.000	55.876
130.0	1.949%11	0.1549	457.0	513.4	620.5	513.4	513.4	1.2087	2.887	0.000	48.977
135.0	1.964%11	0.1561	513.4	566.3	709.1	566.3	566.3	1.2523	4.107	0.000	50.333
140.0	1.980%11	0.1574	566.3	658.9	873.2	658.9	658.9	1.3252	5.809	0.000	55.677
150.0	2.013%11	0.1600	658.9	873.2	1019.3	733.6	733.6	1.3894	19.962	0.000	43.334
160.0	2.049%11	0.1628	733.6	937.7	1150.2	793.1	793.1	1.4503	30.669	0.000	43.000
170.0	2.087%11	0.1659	937.7	1150.2	1269.3	840.7	840.7	1.5097	40.806	0.000	43.000
180.0	2.130%11	0.1693	1150.2	1279.4	1379.4	879.5	879.5	1.5685	49.733	0.000	43.000
190.0	2.177%11	0.1730	1279.4	1482.7	1482.7	911.3	911.3	1.6270	58.351	0.000	43.000
200.0	2.229%11	0.1772	911.3	1566.4	1566.4	937.7	937.7	1.6706	67.504	0.000	43.000
210.0	2.290%11	0.1821	1566.4	1637.2	1637.2	959.6	959.6	1.7061	77.593	0.000	43.000
220.0	2.363%11	0.1878	1637.2	1687.5	1687.5	977.9	977.9	1.7256	88.070	0.000	43.000
230.0	2.456%11	0.1952	1687.5	1712.3	1712.3	993.2	993.2	1.7240	95.635	0.000	43.000
240.0	2.599%11	0.2065	1712.3	1686.5	1686.5	1016.6	1016.6	1.6589	98.527	0.000	43.000
260.0	3.635%11	0.2889	1686.5	1598.5	1598.5	1032.9	1032.9	1.5476	1.000	0.000	43.000
280.0	5.364%11	0.4263	1598.5	1044.4	1506.2	1044.4	1044.4	1.4422	1.000	0.000	43.000
300.0	7.422%11	0.5899	1044.4	7442	1052.4	1442.6	1052.4	1.3707	96.128	3.477	0.000
320.0	9.363%11	0.7442	7442	1052.4	1413.1	1058.7	1058.7	1.3348	92.811	6.669	0.000
340.0	0.1.092%12	0.8682	1058.2	1413.1	1410.4	1062.4	1062.4	1.3238	89.563	9.393	0.000
360.0	1.196%12	0.9506	1410.4	1425.4	1451.2	1065.5	1065.5	1.3274	86.427	1.331	0.000
380.0	1.247%12	0.9912	1065.5	1067.8	1086.2	1086.2	1086.2	1.3422	98.368	1.384	0.000
400.0	1.257%12	0.9994	1067.8	1483.2	1483.2	1106.7	1106.7	1.3360	83.399	1.384	0.000
420.0	1.244%12	0.9647	1483.2	1069.5	1070.8	1518.7	1518.7	1.3401	80.476	1.377	0.000
440.0	1.114%12	0.8853	1070.8	1413.1	1410.4	1062.4	1062.4	1.3327	77.653	17.572	0.000
460.0	9.785%11	0.7777	1071.8	1556.1	1594.7	1237.7	1237.7	1.2122	64.879	0.719	0.000
480.0	8.296%11	0.6594	1072.6	1074.5	1425.4	1425.4	1425.4	1.2884	72.291	2.507	0.000
500.0	6.849%11	0.5444	1073.3	1633.8	1633.8	1294.9	1294.9	1.2618	69.741	1.357	0.000
520.0	5.556%11	0.4416	1073.8	1673.3	1673.3	1353.6	1353.6	1.2361	67.273	3.026	0.000
540.0	4.466%11	0.3549	1074.0	1712.9	1413.0	1413.0	1413.0	1.2122	64.879	3.273	0.000
560.0	3.582%11	0.2847	1074.5	1752.7	1792.8	1532.3	1532.3	1.1902	62.552	3.512	0.000
580.0	2.885%11	0.2293	1074.8	1991.8	1991.8	1698.1	1698.1	1.1902	24.938	2.771	0.000
600.0	2.345%11	0.1864	1075.0	1832.3	1832.3	1591.9	1591.9	1.1510	60.284	3.744	0.000
620.0	1.928%11	0.1533	1075.2	1872.2	1872.2	1651.4	1651.4	1.1337	58.065	3.972	0.000
640.0	1.609%11	0.1279	1075.4	1912.0	1712.0	1413.0	1413.0	1.1222	64.879	4.193	0.000
660.0	1.363%11	0.1084	1075.5	1951.9	1770.2	1425.4	1425.4	1.1176	53.730	4.643	0.000
680.0	1.174%11	0.0933	1075.6	1829.2	1829.2	1413.0	1413.0	1.1027	51.593	4.643	0.000
700.0	1.026%11	0.0816	1075.7	2031.6	1887.8	1591.9	1591.9	1.0889	49.465	4.81	0.000
720.0	9.111%10	0.0724	1075.8	2071.5	1946.0	1651.4	1651.4	1.0762	47.346	5.265	0.000
740.0	8.202%10	0.0652	1075.9	2111.4	2003.4	1609.5	1609.5	1.0645	45.241	5.476	0.000
760.0	7.480%10	0.0595	1075.9	2151.2	2059.9	1667.0	1667.0	1.0539	43.160	5.156	0.000
780.0	6.902%10	0.0549	1076.0	2191.1	2115.1	1633.8	1633.8	1.0443	41.116	5.684	0.000
800.0	6.436%10	0.0512	1076.0	2231.0	2168.7	1609.5	1609.5	1.0287	39.125	5.788	0.000
WE PUT Bl= 3.070 HST											0.000

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH= 6 HOUR= 5.6

CALCULATED VALUES: NLAT= 21.4 MLAT= 8.1 XHI= 90.0
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 SUN DEC.= 23.1
 SUNRISE: 5:6 L.T. SUNSET: 18:4 L.T. NMD= 4.00%08
 NMDF2= 3.20%11 NMFL1= 0.00%-01 NMFL2= 4.00%08
 HMFL2= 271.8 HMFL1= 0.0 HMD= 84.5

			TE/TI	TI	TE	TN			RDD*	RDH#	RDD#	RDN#
H	NE	N/NMAX	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
80.0	2.914%08	9.1%4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.081%08	0.0013	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.845%09	0.0058	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.312%10	0.0410	-1	-1	-1	-1	-1	-1	0.016	0.000	0.623	93.361
100.0	3.193%10	0.0997	-1	-1	-1	-1	-1	-1	0.025	0.000	8.541	91.434
105.0	4.055%10	0.1267	-1	-1	-1	-1	-1	-1	0.040	0.000	10.994	88.966
110.0	3.937%10	0.1230	-1	-1	-1	-1	-1	-1	0.064	0.000	14.085	85.852
115.0	3.157%10	0.0986	-1	-1	-1	-1	-1	-1	0.101	0.000	17.829	82.070
120.0	2.515%10	0.0786	321.0	321.0	321.0	1.0000	1.0000	1.0000	0.000	0.000	21.966	77.875
125.0	2.485%10	0.0776	373.7	373.7	373.7	1.0597	1.0597	1.0597	0.000	0.000	25.782	73.966
130.0	3.084%10	0.0963	425.1	469.7	425.1	1.1049	1.1049	1.1049	0.000	0.000	28.494	71.110
135.0	3.934%10	0.1229	474.1	541.0	474.1	1.1411	1.1411	1.1411	0.000	0.000	30.000	69.377
140.0	6.132%10	0.1915	519.0	608.2	519.0	1.1719	1.1719	1.1719	0.000	0.000	31.126	67.376
145.0	9.258%10	0.2892	594.3	728.1	594.3	1.2252	1.2252	1.2252	1.498	0.000	31.531	65.101
150.0	1.190%11	0.3716	651.3	829.7	651.3	1.2739	1.2739	1.2739	3.368	0.000	31.688	61.633
160.0	1.472%11	0.4597	694.5	917.5	694.5	1.3211	1.3211	1.3211	6.679	0.000	30.852	57.711
180.0	1.763%11	0.5509	727.9	995.5	727.9	1.3676	1.3676	1.3676	11.436	0.000	25.763	56.569
190.0	2.052%11	0.6409	754.3	1066.5	754.3	1.4139	1.4139	1.4139	17.669	0.000	16.079	57.913
200.0	2.323%11	0.7257	775.5	1132.3	775.5	1.4601	1.4601	1.4601	26.008	0.000	8.607	53.827
210.0	2.566%11	0.8017	792.9	1183.8	792.9	1.4930	1.4930	1.4930	37.565	0.000	4.466	41.853
220.0	2.773%11	0.8663	807.2	1227.3	807.2	1.5204	1.5204	1.5204	53.681	0.000	2.307	23.303
230.0	2.938%11	0.9178	819.1	1259.3	819.1	1.5375	1.5375	1.5375	74.390	0.000	0.000	6.796
240.0	3.060%11	0.9559	828.9	1277.6	828.9	1.5412	1.5412	1.5412	92.014	0.000	0.000	1.191
260.0	3.185%11	0.9951	844.0	1274.1	844.0	1.5048	1.5048	1.5048	99.365	0.000	0.000	0.318
280.0	3.192%11	0.9971	854.4	1237.4	854.4	1.4314	1.4314	1.4314	99.536	0.014	0.002	0.364
300.0	3.098%11	0.9677	861.7	1196.9	882.2	1.3567	1.3567	1.3567	99.314	0.014	0.007	0.023
320.0	2.915%11	0.9107	866.9	1169.8	900.0	1.2998	1.2998	1.2998	97.052	0.057	0.000	0.000
340.0	2.669%11	0.8338	870.5	1159.2	917.9	1.2629	1.2629	1.2629	93.704	0.014	0.000	0.000
360.0	2.387%11	0.7455	873.2	1161.5	935.9	1.2411	1.2411	1.2411	90.424	0.014	0.002	0.000
380.0	2.093%11	0.6537	875.2	1172.4	954.2	1.2286	1.2286	1.2286	87.258	0.014	0.000	0.000
400.0	1.808%11	0.5647	876.6	1188.4	973.5	1.2028	1.2028	1.2028	84.201	0.014	0.000	0.000
420.0	1.545%11	0.4827	877.7	1204.4	994.6	1.2110	1.2110	1.2110	81.250	0.014	0.000	0.000
440.0	1.312%11	0.4100	878.6	1222.2	1018.5	1.2001	1.2001	1.2001	78.400	0.014	0.000	0.000
460.0	1.142%11	0.3473	879.2	1241.0	1045.1	1.1875	1.1875	1.1875	75.647	0.014	0.000	0.000
480.0	9.426%10	0.2944	879.7	1260.3	1073.6	1.1739	1.1739	1.1739	72.986	0.014	0.000	0.000
500.0	8.019%10	0.2505	880.0	1280.0	1103.0	1.1605	1.1605	1.1605	70.412	0.014	0.000	0.000
520.0	6.862%10	0.2143	880.4	1299.8	1132.7	1.1475	1.1475	1.1475	67.922	0.014	0.000	0.000
540.0	5.915%10	0.1848	880.7	1319.7	1162.6	1.1351	1.1351	1.1351	65.503	0.014	0.000	0.000
560.0	5.142%10	0.1606	880.9	1339.6	1192.6	1.1233	1.1233	1.1233	63.154	0.014	0.000	0.000
580.0	4.512%10	0.1409	881.1	1359.6	1222.5	1.1121	1.1121	1.1121	60.864	0.014	0.000	0.000
600.0	3.998%10	0.1249	881.2	1379.6	1252.4	1.1015	1.1015	1.1015	58.624	0.014	0.000	0.000
620.0	3.577%10	0.1117	881.3	1399.5	1282.3	1.0914	1.0914	1.0914	56.422	0.014	0.000	0.000
640.0	3.231%10	0.1009	881.5	1419.5	1312.1	1.0818	1.0818	1.0818	54.247	0.014	0.000	0.000
660.0	2.946%10	0.0920	881.5	1439.5	1341.9	1.0728	1.0728	1.0728	52.089	0.014	0.000	0.000
680.0	2.710%10	0.0846	881.6	1459.5	1371.5	1.0642	1.0642	1.0642	49.941	0.014	0.000	0.000
700.0	2.513%10	0.0785	881.7	1479.5	1401.0	1.0561	1.0561	1.0561	47.801	0.014	0.000	0.000
720.0	2.349%10	0.0734	881.7	1499.5	1430.2	1.0485	1.0485	1.0485	45.676	0.014	0.000	0.000
740.0	2.212%10	0.0691	881.8	1519.5	1459.1	1.0414	1.0414	1.0414	43.575	0.014	0.000	0.000
760.0	2.096%10	0.0655	881.8	1539.5	1487.5	1.0350	1.0350	1.0350	41.512	0.014	0.000	0.000
780.0	1.998%10	0.0624	881.8	1559.5	1515.3	1.0292	1.0292	1.0292	39.501	0.014	0.000	0.000
800.0	1.915%10	0.0598	881.9	1579.5	1542.4	1.0241	1.0241	1.0241	37.553	0.014	0.000	0.000

WE PUT B1= 3.0TU GET HST

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH= 6 HOUR= 0:0

CALCULATED VALUES: MLAT= 21.4 MLONG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHI= 142.2
 SUNRISE: 5.6 L.T. SUNSET: 18.4 L.T. SUN DEC= 23.1
 NMFD=5.52%11 NMFL= 0.00%-01 NME=3.20%09 NMDF=4.00%08
 HMFD=347.7 HMFL= 0.0 HME=105.0 HMD= 88.0

		T	E	T/E	T/E/TI	RDD+	RDDH+	RDDH+	RDD+	RDN0+
N/NMAX	NE	5.922%05	1.1% -6	-1	-1	-1	-1	-1	-1	-1
H	0.0	5.922%05	4.5% -4	-1	-1	-1	-1	-1	-1	-1
	5.0	2.494%08	8.6% -4	-1	-1	-1	-1	-1	-1	-1
	5.0	4.737%08	2.513%09	0.0045	-1	-1	-1	-1	-1	-1
	5.0	3.193%09	0.0058	-1	-1	-1	-1	-1	-1	-1
	5.0	3.201%09	0.0058	-1	-1	-1	-1	-1	-1	-1
	5.0	2.680%09	0.0049	-1	-1	-1	-1	-1	-1	-1
	5.0	1.800%09	0.0033	-1	-1	-1	-1	-1	-1	-1
	5.0	1.151%09	0.0021	318.8	318.8	1.0000	0.101	0.000	0.000	6.623
	5.0	7.934%08	0.0014	370.7	371.9	1.0033	0.160	0.000	0.000	93.361
	5.0	4.400%08	0.0012	421.2	423.7	1.0059	0.253	0.000	0.000	91.433
	5.0	6.290%08	0.0011	469.3	473.0	1.0079	0.398	0.000	0.000	88.851
	5.0	7.545%08	0.0014	513.3	518.3	1.0097	0.624	0.000	0.000	82.070
	5.0	1.665%09	0.0030	586.5	594.0	1.0127	1.502	0.000	0.000	77.874
	5.0	3.691%09	0.0067	641.7	651.6	1.0155	3.378	0.000	0.000	73.965
	5.0	6.787%09	0.0123	683.1	695.6	1.0182	6.698	0.000	0.000	65.107
	5.0	1.205%10	0.0218	715.1	730.0	1.0208	11.468	0.000	0.000	61.729
	5.0	2.064%10	0.0374	740.2	757.6	1.0235	17.718	0.000	0.000	58.453
	5.0	3.408%10	0.0617	760.5	780.3	1.0261	26.081	0.000	0.000	67.373
	5.0	5.420%10	0.0981	777.0	799.3	1.0288	37.671	0.000	0.000	60.508
	5.0	8.256%10	0.1495	790.6	815.4	1.0314	53.832	0.000	0.000	31.515
	5.0	1.193%11	0.2159	801.8	829.1	1.0341	74.597	0.000	0.000	30.079
	5.0	1.640%11	0.2968	811.2	841.0	1.0367	92.232	0.000	0.000	22.428
	5.0	2.706%11	0.4898	825.4	860.2	1.0421	97.671	0.000	0.000	59.854
	5.0	3.816%11	0.6907	835.3	875.0	1.0469	87.497	0.000	0.000	63.411
	5.0	4.727%11	0.8558	842.2	886.9	1.0486	76.140	0.000	0.000	58.476
	5.0	5.292%11	0.9581	847.1	896.8	1.0478	66.207	0.000	0.000	44.824
	5.0	5.510%11	0.9975	850.6	905.2	1.0455	57.575	0.000	0.000	24.937
	5.0	5.479%11	0.9919	853.1	912.7	1.0424	50.075	0.000	0.000	0.000
	5.0	5.233%11	0.9473	855.0	919.5	1.0388	43.562	0.000	0.000	0.000
	5.0	4.815%11	0.8717	856.4	925.9	1.0357	37.907	0.000	0.000	0.000
	5.0	4.290%11	0.7767	857.4	901.3	1.0274	33.002	0.000	0.000	0.000
	5.0	3.723%11	0.6740	858.0	926.1	1.0217	28.702	0.000	0.000	0.000
	5.0	3.167%11	0.5733	858.8	926.3	1.0186	25.069	0.000	0.000	0.000
	5.0	2.657%11	0.4810	859.3	926.4	1.0172	21.888	0.000	0.000	0.000
	5.0	2.212%11	0.4004	859.7	926.6	1.0165	19.145	0.000	0.000	0.000
	5.0	2.000%10	0.1666	860.7	927.3	1.0158	10.232	0.000	0.000	0.000
	5.0	1.837%11	0.3325	860.0	926.7	1.0162	16.783	0.000	0.000	0.000
	5.0	1.528%11	0.2767	860.2	926.9	1.0161	14.755	0.000	0.000	0.000
	5.0	1.279%11	0.2315	860.4	927.0	1.0160	13.014	0.000	0.000	0.000
	5.0	1.079%11	0.1954	860.6	927.2	1.0159	11.519	0.000	0.000	0.000
	5.0	9.200%10	0.1666	861.1	927.9	1.0154	6.551	0.000	0.000	0.000
	5.0	7.934%10	0.1436	860.9	927.5	1.0157	9.119	0.000	0.000	0.000
	5.0	6.926%10	0.1254	860.9	927.6	1.0156	8.150	0.000	0.000	0.000
	5.0	6.120%10	0.1108	861.0	927.8	1.0155	7.301	0.000	0.000	0.000
	5.0	5.474%10	0.0991	861.1	927.9	1.0154	84.104	0.000	0.000	0.000
	5.0	4.952%10	0.0891	861.2	928.1	1.0153	84.702	0.000	0.000	0.000
	5.0	4.530%10	0.0820	861.2	928.2	1.0152	5.294	0.000	0.000	0.000
	5.0	4.185%10	0.0758	861.2	928.4	1.0152	4.764	0.000	0.000	0.000
	5.0	3.902%10	0.0706	861.3	928.5	1.0151	4.290	0.000	0.000	0.000
	5.0	3.670%10	0.0664	861.3	928.7	1.0150	3.863	0.000	0.000	0.000
	5.0	3.477%10	0.0629	861.3	928.8	1.0149	3.480	0.000	0.000	0.000

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH=12 HOUR=12.0

CALCULATED VALUES: MLAT= 21.4 MGLA= 8.1 XHI= 37.6
 DTP= 15.9 MDIP= 15.8 SUNSET:17.6 L.T. SUN DEC.= -22.9
 SUNRISE: 6.4 L.T. NMF1= 0.00%-01 NME1= 67%11 NMDF= 1.23%09
 NMF2=1.88%12 HNF1= 0.0 HME=110.0 HMD= 81.1
 HNF2=363.2 HNF1= 0.0 HME=110.0

	NE	N/NMAX	TN	TE	TI	TE/TI	RDO+	RDH+	RDD+	RDH+	RDD+	RDN0+
80.0	1.195%09	6.4%74	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.380%09	0.0013	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.560%10	0.0136	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.808%10	0.0469	-1	-1	-1	-1	0.317	0.000	0.000	67.438	32.245	32.245
100.0	1.452%11	0.0773	-1	-1	-1	-1	0.474	0.000	0.000	64.558	34.968	34.968
105.0	1.654%11	0.0881	-1	-1	-1	-1	0.707	0.000	0.000	61.789	37.504	37.504
110.0	1.671%11	0.0890	-1	-1	-1	-1	1.055	0.000	0.000	59.106	39.839	39.839
115.0	1.709%11	0.0910	-1	-1	-1	-1	1.574	0.000	0.000	56.463	41.966	41.966
120.0	1.746%11	0.0930	336.9	336.9	1.0000	1.0000	0.000	0.000	0.000	53.780	43.876	43.876
125.0	1.785%11	0.0951	395.7	432.4	2.345	2.345	0.000	0.000	0.000	50.969	45.542	45.542
130.0	1.826%11	0.0972	453.1	526.4	3.489	3.489	0.000	0.000	0.000	48.020	46.802	46.802
135.0	1.867%11	0.0995	508.5	618.4	5.178	5.178	0.000	0.000	0.000	45.000	47.349	47.349
140.0	1.910%11	0.1018	560.4	707.0	7.651	7.651	0.000	0.000	0.000	38.670	45.073	45.073
150.0	2.001%11	0.1066	650.9	870.7	10.257	10.257	0.000	0.000	0.000	30.293	37.848	37.848
160.0	2.099%11	0.1118	723.2	1016.3	12.4053	12.4053	0.000	0.000	0.000	19.797	27.070	27.070
170.0	2.204%11	0.1174	780.5	1146.8	14.694	14.694	0.000	0.000	0.000	11.703	16.434	16.434
180.0	2.319%11	0.1235	826.1	1265.8	18.5322	18.5322	0.000	0.000	0.000	6.774	10.368	10.368
190.0	2.443%11	0.1301	863.1	1376.0	22.658	22.658	0.000	0.000	0.000	3.909	8.452	8.452
200.0	2.581%11	0.1374	893.4	1479.6	27.3377	27.3377	0.000	0.000	0.000	2.255	7.735	7.735
210.0	2.732%11	0.1455	918.4	1563.0	31.859	31.859	0.000	0.000	0.000	1.301	7.279	7.279
220.0	2.903%11	0.1546	939.2	1633.6	33.133	33.133	0.000	0.000	0.000	0.750	6.743	6.743
230.0	3.096%11	0.1649	956.5	1683.7	37.933	37.933	0.000	0.000	0.000	0.433	6.078	6.078
240.0	3.321%11	0.1769	971.0	1708.4	41.594	41.594	0.000	0.000	0.000	0.144	4.463	4.463
250.0	3.935%11	0.2096	993.2	1682.8	45.652	45.652	0.000	0.000	0.000	0.048	2.702	2.702
260.0	5.860%11	0.3121	1008.6	1595.3	50.817	50.817	0.000	0.000	0.000	0.016	1.591	1.591
280.0	8.840%12	0.5637	1019.4	1503.4	51.4746	51.4746	0.000	0.000	0.000	0.005	0.529	0.529
300.0	1.058%12	0.9107	1027.1	1440.2	51.7989	51.7989	0.000	0.000	0.000	0.002	0.176	0.176
320.0	1.505%12	0.9017	1027.1	1440.2	51.7994	51.7994	0.000	0.000	0.000	0.001	0.059	0.059
340.0	1.786%12	0.9514	1032.5	1410.9	52.6944	52.6944	0.000	0.000	0.000	0.001	0.020	0.020
360.0	1.876%12	0.9993	1036.5	1408.2	55.008	55.008	0.000	0.000	0.000	0.000	0.006	0.006
380.0	1.840%12	0.9801	1039.4	1423.2	56.106	56.106	0.000	0.000	0.000	0.000	0.002	0.002
400.0	1.710%12	0.9107	1041.5	1448.9	57.1078	57.1078	0.000	0.000	0.000	0.000	0.000	0.000
420.0	1.515%12	0.8067	1043.2	1480.8	58.1102	58.1102	0.000	0.000	0.000	0.000	0.000	0.000
440.0	1.289%12	0.6863	1044.4	1516.1	59.1136	59.1136	0.000	0.000	0.000	0.000	0.000	0.000
460.0	1.062%12	0.5657	1045.4	1553.4	60.1182	60.1182	0.000	0.000	0.000	0.000	0.000	0.000
480.0	8.554%11	0.4556	1046.1	1591.7	61.1236	61.1236	0.000	0.000	0.000	0.000	0.000	0.000
500.0	6.791%11	0.3617	1046.7	1630.7	62.1293	62.1293	0.000	0.000	0.000	0.000	0.000	0.000
520.0	5.256%11	0.2853	1047.2	1670.0	63.2352	63.2352	0.000	0.000	0.000	0.000	0.000	0.000
540.0	4.224%11	0.2250	1047.6	1709.5	64.677	64.677	0.000	0.000	0.000	0.000	0.000	0.000
560.0	3.351%11	0.1785	1047.9	1749.1	66.3132	66.3132	0.000	0.000	0.000	0.000	0.000	0.000
580.0	2.684%11	0.1429	1048.2	1788.7	67.1287	67.1287	0.000	0.000	0.000	0.000	0.000	0.000
600.0	2.177%11	0.1160	1048.4	1828.4	68.1504	68.1504	0.000	0.000	0.000	0.000	0.000	0.000
620.0	1.793%11	0.0955	1048.6	1868.0	69.643	69.643	0.000	0.000	0.000	0.000	0.000	0.000
640.0	1.500%11	0.0799	1048.7	1907.7	70.776	70.776	0.000	0.000	0.000	0.000	0.000	0.000
660.0	1.276%11	0.0679	1048.8	1947.4	72.066	72.066	0.000	0.000	0.000	0.000	0.000	0.000
680.0	1.102%11	0.0587	1049.0	1987.1	73.904	73.904	0.000	0.000	0.000	0.000	0.000	0.000
700.0	9.672%10	0.0515	1049.0	2026.8	74.643	74.643	0.000	0.000	0.000	0.000	0.000	0.000
720.0	8.612%10	0.0459	1049.1	2066.5	75.710	75.710	0.000	0.000	0.000	0.000	0.000	0.000
740.0	7.772%10	0.0414	1049.2	2106.2	76.793	76.793	0.000	0.000	0.000	0.000	0.000	0.000
760.0	7.101%10	0.0378	1049.3	2145.9	77.857	77.857	0.000	0.000	0.000	0.000	0.000	0.000
780.0	6.561%10	0.0349	1049.3	2185.6	78.903	78.903	0.000	0.000	0.000	0.000	0.000	0.000
800.0	6.123%10	0.0326	1049.3	2225.3	79.057	79.057	0.000	0.000	0.000	0.000	0.000	0.000
WE PUT B1F	3.070	GET HST			79.285	79.285	0.000	0.000	0.000	0.000	0.000	0.000

INPUT: LATI= 14.7 LONGI= 342.6 R=100 MONTH=12 HOUR= 6.4

CALCULATED VALUES: MLAT= 21.4 MLNG= 55.4
 DIP= 15.9 MODIP= 15.8 MAGLA= 8.1 XHI= 90.0
 SUNRISE= 6:4 L-T. SUNSET= 17:6 L-T.
 NMFF2= 5.09%11 NMFI1= 0.00%01 NMFE= 4.13%10 NMDF= 4.00%08
 HMF2= 294.7 HMF1= 0.0 HME= 107.5 HMD= 84.5

RDNO+		RD00+		RDHE+		RD00+		TE/TI		
N	NE	N/NMAX	TN	TE	TI	RDHE+	RD00+	RDHE+	RDNO+	
4	0	2.914%	0.08	5.7%-4	-1	-1	-1	-1	-1	
5	0	4.081%	0.08	8.0%-4	-1	-1	-1	-1	-1	
5	0	1.845%	0.09	0.0036	-1	-1	-1	-1	-1	
5	0	0.216%	0.10	0.0259	-1	-1	-1	-1	-1	
5	0	3.212%	0.10	0.0631	-1	-1	-1	-1	-1	
5	0	4.088%	0.10	0.0803	-1	-1	-1	-1	-1	
5	0	9.967%	0.10	0.0780	-1	-1	-1	-1	-1	
5	0	3.168%	0.10	0.0623	-1	-1	-1	-1	-1	
5	0	2.513%	0.10	0.0494	-1	-1	-1	-1	-1	
5	0	2.482%	0.10	0.0488	-1	-1	-1	-1	-1	
5	0	3.094%	0.10	0.0608	-1	-1	-1	-1	-1	
5	0	3.962%	0.10	0.0779	-1	-1	-1	-1	-1	
5	0	3.168%	0.10	0.0623	-1	-1	-1	-1	-1	
5	0	2.09	0.10	4.446%	10	0.0874	320.1	320.1	1.0000	
5	0	0.00	0.10	5.203%	10	0.1038	394.9	372.5	0.000	
5	0	6.338%	10	0.1246	10	0.457	468.3	423.5	0.003	
5	0	7.710%	10	0.1515	10	0.1515	539.3	472.1	0.006	
5	0	9.599%	10	0.1887	10	0.1887	991.4	722.7	0.012	
5	0	1.255%	11	0.2468	11	0.2468	748.5	1062.0	0.023	
5	0	1.730%	11	0.3400	11	0.3400	769.4	1127.7	0.044	
5	0	2.268%	11	0.457	11	0.457	786.4	1179.0	0.084	
5	0	2.832%	11	0.5567	11	0.5567	800.4	1222.5	0.161	
5	0	3.387%	11	0.6557	11	0.6557	812.0	1254.6	0.308	
5	0	3.894%	11	0.7653	11	0.7653	821.7	1273.0	0.586	
5	0	4.657%	11	0.9153	11	0.9153	836.4	1269.9	0.935	
5	0	5.025%	11	0.9877	11	0.9877	846.6	1233.6	1.423	
5	0	5.081%	11	0.9986	11	0.9986	853.7	1193.7	1.923	
5	0	4.935%	11	0.9700	11	0.9700	858.0	1167.2	2.423	
5	0	4.	627%	11	0.9094	11	0.9094	862.4	1157.2	3.023
5	0	4.	202%	11	0.8259	11	0.8259	865.0	1160.2	3.614
5	0	3.	714%	11	0.7299	11	0.7299	866.9	1171.7	4.214
5	0	3.	210%	11	0.6310	11	0.6310	868.3	1188.4	4.814
5	0	0.	3.331%	11	0.5364	11	0.5364	869.4	1204.4	5.414
5	0	0.	2.729%	11	0.4508	11	0.4508	870.2	1222.2	6.014
5	0	0.	2.294%	11	0.3764	11	0.3764	870.8	1241.0	6.614
5	0	0.	1.915%	11	0.3135	11	0.3135	871.3	1260.3	7.214
5	0	0.	1.595%	11	0.2616	11	0.2616	871.7	1280.0	7.814
5	0	0.	1.116%	11	0.2193	11	0.2193	872.1	1299.8	8.414
5	0	0.	9.422%	10	0.1852	10	0.1852	872.3	1319.7	9.014
5	0	0.	8.027%	10	0.1578	10	0.1578	872.5	1339.6	8.614
5	0	0.	6.908%	10	0.1358	10	0.1358	872.7	1359.6	7.214
5	0	0.	6.009%	10	0.1181	10	0.1181	873.3	1379.5	6.814
5	0	0.	5.286%	10	0.1039	10	0.1039	872.9	1409.5	5.414
5	0	0.	4.702%	10	0.0924	10	0.0924	873.0	1419.5	4.014
5	0	0.	4.228%	10	0.0831	10	0.0831	873.1	1439.5	3.614
5	0	0.	3.841%	10	0.0755	10	0.0755	873.2	1459.5	3.214
5	0	0.	3.524%	10	0.0693	10	0.0693	873.3	1479.5	2.814
5	0	0.	3.262%	10	0.0641	10	0.0641	873.4	1499.5	2.414
5	0	0.	3.046%	10	0.0599	10	0.0599	873.5	1519.5	2.014
5	0	0.	2.865%	10	0.0563	10	0.0563	873.6	1539.5	1.614
5	0	0.	2.744%	10	0.0534	10	0.0534	873.7	1559.5	1.214
5	0	0.	2.588%	10	0.0509	10	0.0509	873.8	1579.5	0.814

INPUT: LATI= 14.7 LONG1= 342.6 R=100 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= 21.4 MAGLA= 8.1 XHI= 171.8
 DIP= 15.9 MDIDIP= 15.8 SUNSET=117.6 L.T. SUN DEC.= -22.9
 SUNRISE: 6.4 L.T. NMF1= 0.00% -01 NME=3.20%09 NMHD=4.00%08
 NMF2=1.25%12 NMF1= 0.0 HMD= 88.0
 HMF2=300.6 HME=105.0

		TE/TI	TI	TE	TN	NE/NMAX	H
1	-1	-1	-1	-1	-1	5.271%05	80.0
2	-1	-1	-1	-1	-1	4.2%-7	85.0
3	-1	-1	-1	-1	-1	2.0%-4	85.0
4	-1	-1	-1	-1	-1	3.8%-4	90.0
5	-1	-1	-1	-1	-1	2.507%09	95.0
6	-1	-1	-1	-1	-1	1.93%09	100.0
7	-1	-1	-1	-1	-1	2.201%09	105.0
8	-1	-1	-1	-1	-1	2.678%09	110.0
9	-1	-1	-1	-1	-1	1.796%09	115.0
10	-1	-1	-1	-1	-1	1.146%09	120.0
11	-1	-1	-1	-1	-1	7.886%08	125.0
12	-1	-1	-1	-1	-1	4.826%09	130.0
13	-1	-1	-1	-1	-1	6.349%08	135.0
14	-1	-1	-1	-1	-1	6.228%08	140.0
15	-1	-1	-1	-1	-1	7.461%08	145.0
16	-1	-1	-1	-1	-1	1.647%09	150.0
17	-1	-1	-1	-1	-1	0.0013	160.0
18	-1	-1	-1	-1	-1	0.039	170.0
19	-1	-1	-1	-1	-1	0.0236	175.0
20	-1	-1	-1	-1	-1	0.952%10	180.0
21	-1	-1	-1	-1	-1	1.178%11	185.0
22	-1	-1	-1	-1	-1	2.286%11	190.0
23	-1	-1	-1	-1	-1	5.439%11	195.0
24	-1	-1	-1	-1	-1	6.735%11	200.0
25	-1	-1	-1	-1	-1	1.228%12	210.0
26	-1	-1	-1	-1	-1	7.993%11	220.0
27	-1	-1	-1	-1	-1	9.144%11	230.0
28	-1	-1	-1	-1	-1	0.014%12	240.0
29	-1	-1	-1	-1	-1	1.156%12	260.0
30	-1	-1	-1	-1	-1	1.025%12	280.0
31	-1	-1	-1	-1	-1	8.888%11	300.0
32	-1	-1	-1	-1	-1	1.249%12	320.0
33	-1	-1	-1	-1	-1	1.221%12	340.0
34	-1	-1	-1	-1	-1	1.142%12	360.0
35	-1	-1	-1	-1	-1	0.8210	380.0
36	-1	-1	-1	-1	-1	0.7119	400.0
37	-1	-1	-1	-1	-1	0.5999	420.0
38	-1	-1	-1	-1	-1	0.491%11	440.0
39	-1	-1	-1	-1	-1	0.221%12	460.0
40	-1	-1	-1	-1	-1	0.16%11	480.0
41	-1	-1	-1	-1	-1	0.038%11	500.0
42	-1	-1	-1	-1	-1	3.240%11	520.0
43	-1	-1	-1	-1	-1	2.603%11	540.0
44	-1	-1	-1	-1	-1	5.016%11	560.0
45	-1	-1	-1	-1	-1	1.714%11	580.0
46	-1	-1	-1	-1	-1	0.412%11	600.0
47	-1	-1	-1	-1	-1	1.178%11	620.0
48	-1	-1	-1	-1	-1	9.557%10	640.0
49	-1	-1	-1	-1	-1	5.814%10	660.0
50	-1	-1	-1	-1	-1	5.244%10	680.0
51	-1	-1	-1	-1	-1	8.783%10	700.0
52	-1	-1	-1	-1	-1	4.407%10	720.0
53	-1	-1	-1	-1	-1	4.099%10	740.0
54	-1	-1	-1	-1	-1	3.633%10	760.0
55	-1	-1	-1	-1	-1	3.844%10	780.0
56	-1	-1	-1	-1	-1	3.070 GET HST	800.0

INPUT: LATI= -12.0 LONGI= 283.1 R= 10 MONTH= 3 HnUR=12.0

CALCULATED VALUES: NLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MODIP= 2.8 MAGLA= 1.4 XHI= 8.7
 SUNRISE: 6.0 L.T. SUNSET:18.0 L.T. SUN DEC.: -3.3
 NMF2=7.44%11 NMFL1= 2.46%11 NME=1.47%11 NMD=6.25%08
 HMFR2=379.1 HMFL1=285.2 HME=110.0 HMMD= 81.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDH+	RDHE+	RDH-	RDD-	RDH-	RDHE-	RDD2+	RDH2+	RDHE2+	RDD2-	RDH2-	RDHE2-		
80.0	6.073%08	8.2%4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
85.0	1.219%09	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
90.0	1.424%10	0.0191	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
95.0	5.926%10	0.0796	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
100.0	1.157%11	0.1555	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
105.0	1.436%11	0.1930	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
110.0	1.472%11	0.1979	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
115.0	1.466%11	0.1970	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1			
120.0	1.473%11	0.1980	308.1	308.1	1.0000	1.269	0.000	0.000	0.000	0.000	0.000	0.000	59.900	59.900	38.831	38.831	38.831			
125.0	1.480%11	0.1990	355.9	388.9	1.0928	1.984	0.000	0.000	0.000	0.000	0.000	0.000	53.778	53.778	44.239	44.239	44.239			
130.0	1.488%11	0.2000	402.4	468.4	402.4	1.1642	3.084	0.000	0.000	0.000	0.000	0.000	0.000	47.802	47.802	49.115	49.115	49.115		
135.0	1.496%11	0.2010	446.2	545.3	446.2	1.2221	4.747	0.000	0.000	0.000	0.000	0.000	0.000	42.150	42.150	53.104	53.104	53.104		
140.0	1.503%11	0.2021	485.7	617.8	485.7	1.2720	7.191	0.000	0.000	0.000	0.000	0.000	0.000	37.000	37.000	55.809	55.809	55.809		
150.0	1.520%11	0.2043	549.5	747.6	549.5	1.3606	15.191	0.000	0.000	0.000	0.000	0.000	0.000	28.373	28.373	56.479	56.479	56.479		
160.0	1.537%11	0.2066	595.8	860.1	595.8	1.4434	26.424	0.000	0.000	0.000	0.000	0.000	0.000	21.708	21.708	51.867	51.867	51.867		
170.0	1.556%11	0.2091	629.8	960.1	629.8	1.5244	36.968	0.000	0.000	0.000	0.000	0.000	0.000	16.519	16.519	46.514	46.514	46.514		
180.0	1.575%11	0.2117	655.5	1051.8	655.5	1.6046	44.319	0.000	0.000	0.000	0.000	0.000	0.000	12.212	12.212	43.469	43.469	43.469		
190.0	1.596%11	0.2145	675.5	1137.9	675.5	1.6845	49.411	0.000	0.000	0.000	0.000	0.000	0.000	8.423	8.423	42.166	42.166	42.166		
200.0	1.619%11	0.2176	691.4	1219.9	691.4	1.7643	53.595	0.000	0.000	0.000	0.000	0.000	0.000	5.543	5.543	40.862	40.862	40.862		
210.0	1.644%11	0.2210	704.3	1396.0	704.3	1.9821	57.582	0.000	0.000	0.000	0.000	0.000	0.000	3.608	3.608	38.810	38.810	38.810		
220.0	1.672%11	0.2247	714.9	1590.5	714.9	2.2247	61.669	0.000	0.000	0.000	0.000	0.000	0.000	2.347	2.347	35.987	35.987	35.987		
230.0	1.703%11	0.2288	723.7	1793.4	723.7	2.4774	65.976	0.000	0.000	0.000	0.000	0.000	0.000	1.523	1.523	32.501	32.501	32.501		
240.0	1.738%11	0.2336	730.9	1989.0	732.7	2.7145	70.560	0.000	0.000	0.000	0.000	0.000	0.000	0.990	0.990	28.450	28.450	28.450		
260.0	1.836%11	0.2467	742.0	2276.3	750.3	3.0338	80.677	0.000	0.000	0.000	0.000	0.000	0.000	0.418	0.418	18.905	18.905	18.905		
280.0	2.346%11	0.3154	749.6	2315.6	767.9	3.0155	91.858	0.000	0.000	0.000	0.000	0.000	0.000	0.176	0.176	7.966	7.966	7.966		
300.0	3.685%11	0.4952	755.0	2107.2	785.5	2.6827	98.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	0.074	1.926	1.926	1.926		
320.0	5.318%11	0.7147	758.0	1788.5	803.1	2.2270	96.168	2.618	0.000	0.000	0.000	0.000	0.000	0.000	0.031	0.031	0.892	0.892	0.892	
340.0	6.588%11	0.8853	761.4	1498.1	820.9	1.8249	92.858	6.077	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.013	0.376	0.376	0.376	
360.0	7.273%11	0.9774	763.4	1295.3	839.1	1.5436	89.608	9.205	1.023	0.000	0.000	0.000	0.000	0.000	0.000	0.159	0.159	0.159	0.159	0.159
380.0	7.440%11	0.9999	764.8	1178.2	858.5	1.3724	86.470	12.114	1.346	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.067	0.067	0.067	0.067
400.0	7.196%11	0.9670	765.9	1123.7	880.8	1.2757	83.441	14.877	1.653	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.028	0.028	0.028	0.028
420.0	6.582%11	0.8846	766.7	1109.0	909.3	1.2196	80.517	17.524	1.947	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.012	0.012	0.012	0.012
440.0	5.749%11	0.8853	767.3	1118.0	947.0	1.1806	77.792	20.072	2.230	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.005	0.005	0.005
460.0	4.846%11	0.6512	767.8	1140.7	993.9	1.1477	74.964	22.530	2.503	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
480.0	3.986%11	0.5356	768.2	1171.0	1046.5	1.0745	72.327	24.905	2.767	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500.0	3.233%11	0.4345	768.5	1205.6	1101.3	1.0947	69.776	27.201	3.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
520.0	2.612%11	0.3510	768.7	1242.5	1156.3	1.0745	67.307	29.424	3.269	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
540.0	2.118%11	0.7726	767.3	1280.7	1210.4	1.0581	64.912	31.580	3.509	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
560.0	1.734%11	0.2330	769.4	1319.7	1263.0	1.0449	62.584	33.675	3.742	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
580.0	1.440%11	0.1935	769.5	1359.0	1313.8	1.0344	60.315	35.715	3.969	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
600.0	1.215%11	0.1633	769.6	1398.6	1362.6	1.0264	58.095	37.715	4.191	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
620.0	1.044%11	0.1402	769.4	1438.2	1409.5	1.0204	55.912	39.679	4.409	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
640.0	9.123%10	0.1226	769.4	1478.0	1454.7	1.0160	53.757	41.619	4.624	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
660.0	8.113%10	0.1090	769.5	1517.7	1498.5	1.0128	51.619	43.543	4.838	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
680.0	7.331%10	0.0985	769.5	1557.5	1541.2	1.0106	49.490	45.459	5.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
700.0	6.720%10	0.0903	769.6	1597.3	1583.0	1.0090	47.370	47.367	5.263	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
720.0	6.240%10	0.0839	769.6	1637.1	1624.2	1.0079	45.264	49.264	5.474	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
740.0	5.881%10	0.0788	769.7	1676.9	1665.0	1.0072	43.181	51.137	5.682	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
760.0	5.559%10	0.0747	769.7	1716.7	1705.5	1.0066	41.137	52.977	5.886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
780.0	5.318%10	0.0715	769.7	1756.5	1745.7	1.0062	39.144	54.770	6.086	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
800.0	5.124%10	0.0689	769.7	1796.3	1785.8	1.0059	37.215	56.507	6.279	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

WE PUT B1= 3.070 GET HST

INPUT: LATI = -12.0 LONGI = 283.1 R = 10 MONTH = 3 HOUR = 6.0

CALCULATED VALUES: MLAT= -0.7 MLATG= 323.1 XHI= 90.0
 DIP= 2.7 MODIP= 2.8 MAGLA= 1.4 XLT= -3.3
 SUNRISE: 6:00 L.T. SUNSET: 18:00 L.T. SUN DEC.= -3.3
 NMFD1= 1.53% NMFD1= 0.00% NMFD1= 2.77% NMFD1= 4.00%
 HME2= 244.5 HME1= 0.0 HME= 107.5 HMD= 84.5

RDNO+ RDO2+		RDHE+ RDH+		TE/TI T1		TE TN		N/NMAX NE	
80.0	2.914%	80.0	0.0019	-1	-1	-1	-1	82.0	0.02
85.0	4.081%	85.0	0.0027	-1	-1	-1	-1	82.0	0.02
90.0	1.836%	90.0	0.0020	-1	-1	-1	-1	79.0	0.08
95.0	1.145%	100.0	0.0750	-1	-1	-1	-1	75.0	0.72
100.0	2.357%	100.0	0.1544	-1	-1	-1	-1	72.0	0.3
105.0	2.755%	105.0	0.1804	-1	-1	-1	-1	24.0	2.32
110.0	2.666%	110.0	0.1746	-1	-1	-1	-1	27.0	0.88
115.0	2.147%	115.0	0.1406	-1	-1	-1	-1	17.0	9.51
120.0	1.703%	120.0	0.1116	287.6	287.6	0.000	0.000	20.0	8.89
125.0	1.683%	125.0	0.1102	327.6	327.6	0.000	0.000	36.0	3.02
130.0	2.123%	130.0	0.1390	327.6	366.3	0.020	0.031	63.0	6.2
135.0	2.723%	135.0	0.1783	402.0	402.0	0.048	0.048	4.0	2.32
140.0	3.012%	140.0	0.1973	402.0	469.2	0.074	0.074	27.0	0.88
145.0	3.589%	145.0	0.2350	469.2	522.7	0.115	0.115	31.0	5.25
150.0	4.388%	150.0	0.2874	513.1	513.1	0.178	0.178	36.0	5.10
155.0	5.765%	155.0	0.3776	535.8	535.8	0.275	0.275	35.0	3.60
160.0	7.977%	160.0	0.552.4	821.1	566.4	0.426	0.426	36.0	9.80
165.0	10.953%	165.0	0.6453	878.6	566.4	0.656	0.656	62.0	3.34
170.0	13.731%	170.0	0.7680	933.4	580.3	1.2794	1.2794	65.0	31.0
175.0	1.325%	175.0	0.6680	1030.9	594.2	1.3491	1.3491	61.0	2.8
180.0	1.434%	180.0	0.9393	589.8	759.7	1.671	1.671	61.0	2.8
185.0	1.498%	185.0	0.9509	1137.0	608.1	1.671	1.671	59.0	7.9
190.0	1.525%	190.0	0.9985	595.2	595.2	1.671	1.671	33.0	7.27
195.0	1.509%	195.0	0.9883	601.2	601.2	1.8698	1.8698	28.0	9.12
200.0	1.439%	200.0	0.9422	1246.7	608.1	2.0045	2.0045	19.0	18.4
205.0	1.327%	205.0	0.8694	595.2	622.0	2.1267	2.1267	10.0	7.01
210.0	1.191%	210.0	0.7802	616.7	635.9	2.1267	2.1267	71.0	0.4
215.0	1.046%	215.0	0.6848	618.4	1167.4	2.1267	2.1267	5.0	7.32
220.0	9.028%	220.0	0.5913	619.6	1076.6	2.2759	2.2759	69.0	8.6
225.0	8.710%	225.0	0.5050	620.4	802.4	2.2759	2.2759	18.0	0.69
230.0	6.546%	230.0	0.4287	621.1	830.1	2.3494	2.3494	1.0	0.020
235.0	5.51%	235.0	0.3635	621.6	1012.4	2.0166	2.0166	0.0	0.006
240.0	4.719%	240.0	0.3094	622.0	1005.0	886.0	886.0	0.0	0.006
245.0	4.034%	245.0	0.2642	622.3	1009.5	914.3	914.3	0.0	0.006
250.0	3.476%	250.0	0.2276	622.5	1028.8	942.9	942.9	0.0	0.006
255.0	3.024%	255.0	0.1980	622.7	1053.5	99.6	99.6	0.0	0.006
260.0	2.658%	260.0	0.1741	622.8	1072.1	1027.3	1027.3	0.0	0.006
265.0	2.362%	265.0	0.1547	622.9	1091.3	1054.2	1054.2	0.0	0.006
270.0	2.123%	270.0	0.1390	623.0	1020.9	1080.2	1080.2	0.0	0.006
275.0	1.928%	275.0	0.1263	623.1	1105.2	1105.2	1105.2	0.0	0.006
280.0	1.769%	280.0	0.1159	623.2	1150.5	1129.3	1129.3	0.0	0.006
285.0	1.639%	285.0	0.1073	623.2	1170.4	1152.4	1152.4	0.0	0.006
290.0	1.532%	290.0	0.1003	623.3	1190.3	1174.7	1174.7	0.0	0.006
295.0	1.443%	295.0	0.0945	623.3	1210.3	1196.4	1196.4	0.0	0.006
300.0	1.370%	300.0	0.0897	623.3	1230.3	1217.7	1217.7	0.0	0.006
305.0	1.309%	305.0	0.0857	623.4	1250.3	1238.5	1238.5	0.0	0.006
310.0	1.258%	310.0	0.0824	623.4	1270.3	1259.1	1259.1	0.0	0.006
315.0	1.216%	315.0	0.0796	623.4	1290.3	1279.5	1279.5	0.0	0.006
320.0	1.180%	320.0	0.0753	623.4	1310.3	1299.7	1299.7	0.0	0.006
325.0	1.124%	325.0	0.0736	623.5	1330.3	1319.9	1319.9	0.0	0.006

INPUT: LATI= -12.0 LONGI= 283.1 R= 10 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MODIP= 2.8 MAGLA= 1.4 XHI= 164.7
 SUNRISE: 6.0 L.T. SUNSET: 18.0 L.T. SUN DEC.= -3.3
 NMF2=5.89%11 NMFI= 0.00%01 NMME=1.78%09 NMHD=4.00%08
 HMF2=270.7 HMFI= 0.0 HME=105.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDE+	RDN+	RDN+
80.0	5.555%05	9.4%-7	-1	-1	-1	-1	-1	-1	-1
85.0	2.480%08	4.2%-4	-1	-1	-1	-1	-1	-1	-1
90.0	4.731%08	8.0%-4	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%09	0.0030	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%09	0.0030	-1	-1	-1	-1	-1	-1	-1
105.0	1.775%09	0.0030	-1	-1	-1	0.002	0.000	0.000	17.951
110.0	1.499%09	0.0025	-1	-1	-1	0.031	0.000	0.000	20.889
115.0	1.018%09	0.0017	-1	-1	-1	0.049	0.000	0.000	24.232
120.0	6.506%08	0.0011	284.5	284.5	1.0000	0.076	0.000	0.000	27.888
125.0	4.441%08	7.5%-4	323.2	323.2	1.0165	0.118	0.000	0.000	31.525
130.0	3.542%08	6.0%-4	360.7	371.4	1.0296	0.182	0.000	0.000	34.510
135.0	3.474%08	5.9%-4	395.3	411.3	1.0405	0.283	0.000	0.000	36.302
140.0	4.233%08	7.2%-4	425.1	446.5	1.0502	0.437	0.000	0.000	36.980
150.0	1.003%09	0.0017	470.4	502.5	1.0681	0.673	0.000	0.000	62.327
160.0	2.887%09	0.0049	501.0	543.7	1.0853	1.563	0.000	0.000	36.329
170.0	1.049%10	0.0178	522.2	575.6	1.1023	3.441	0.000	0.000	65.308
180.0	2.925%10	0.0497	537.8	601.9	1.1023	6.648	0.000	0.000	69.416
190.0	6.580%10	0.1118	549.6	624.4	1.1189	10.708	0.000	0.000	79.779
200.0	1.256%11	0.2135	559.0	644.4	1.1304	14.764	0.000	0.000	75.012
210.0	2.087%11	0.3547	566.5	662.6	1.1368	18.721	0.000	0.000	61.199
220.0	3.067%11	0.5211	572.6	679.4	1.1398	22.945	0.000	0.000	53.727
230.0	4.051%11	0.6883	577.6	695.0	1.1403	27.785	0.000	0.000	59.625
240.0	4.888%11	0.8306	581.7	709.9	1.1390	33.510	0.000	0.000	60.380
260.0	5.793%11	0.9843	588.0	737.5	1.1364	40.359	0.000	0.000	19.184
280.0	5.852%11	0.9944	592.3	763.2	1.1284	58.472	0.000	0.000	66.052
300.0	5.580%11	0.9482	595.4	787.6	1.1183	83.683	0.000	0.000	70.701
320.0	5.092%11	0.8652	597.5	811.1	1.1071	98.000	0.000	0.000	5.732
340.0	4.476%11	0.7606	599.0	834.0	1.0958	86.769	0.000	0.000	69.163
360.0	3.819%11	0.6489	600.1	856.5	1.0846	74.041	0.000	0.000	64.867
380.0	3.186%11	0.5414	600.9	878.6	1.0742	63.138	0.000	0.000	58.777
400.0	2.620%11	0.4452	601.5	900.6	1.0652	53.857	0.000	0.000	41.284
420.0	2.138%11	0.3633	602.0	900.2	1.0593	45.963	0.000	0.000	16.248
440.0	1.743%11	0.2961	602.4	900.6	1.0336	39.254	0.000	0.000	1.980
460.0	1.426%11	0.2423	602.6	900.6	1.0167	54.671	0.000	0.000	0.608
480.0	1.176%11	0.1998	602.8	900.7	1.0077	33.132	0.000	0.000	0.172
500.0	9.800%10	0.1665	603.0	900.8	1.0037	41.516	0.000	0.000	0.049
520.0	8.275%10	0.1406	603.1	900.3	1.0021	21.202	0.000	0.000	0.014
540.0	7.086%10	0.1204	603.2	901.0	1.0015	18.304	0.000	0.000	0.004
560.0	6.157%10	0.1046	603.3	901.1	1.0013	15.871	0.000	0.000	0.000
580.0	5.426%10	0.0922	603.4	901.2	1.0012	13.832	0.000	0.000	0.000
600.0	4.849%10	0.0824	603.5	901.3	1.0012	12.122	0.000	0.000	0.000
620.0	4.390%10	0.0746	603.5	901.4	1.0012	10.681	0.000	0.000	0.000
640.0	4.022%10	0.0683	603.6	901.5	1.0012	9.460	0.000	0.000	0.000
660.0	3.726%10	0.0633	603.6	901.6	1.0012	8.416	0.000	0.000	0.000
680.0	3.486%10	0.0592	603.6	901.7	1.0012	7.513	0.000	0.000	0.000
700.0	3.290%10	0.0559	603.6	901.8	1.0012	6.726	0.000	0.000	0.000
720.0	3.130%10	0.0532	603.7	901.9	1.0012	6.033	0.000	0.000	0.000
740.0	2.998%10	0.0509	603.7	902.0	1.0012	5.420	0.000	0.000	0.000
760.0	2.889%10	0.0491	603.7	902.1	1.0012	4.874	0.000	0.000	0.000
780.0	2.799%10	0.0476	603.7	902.2	1.0012	4.386	0.000	0.000	0.000
800.0	2.724%10	0.0463	603.7	902.3	1.0012	3.948	0.000	0.000	0.000
WE PUR 61= 3.0TU GET HST						3.556	86.800	0.000	0.000

INPUT: LATI= -12.0 LONGI= 283.1 R= 10 MONTH= 6 HOUR= 12.0

CALCULATED VALUES: MLAT = -0.7 MLNG = 35.1 XHI = 35.1
 DIP = 2.7 MODIP = 2.8 MAGLA = 1.4 XLT = 23.1
 SUNRJSE = 6.3 L.T. SUNSET = 17.7 SUN DEC = 23.1
 NMFC#2=4.59%11 NMFL1 = 0.00%01 NMEL1 = 31%11 NMDD=5, 83%08
 NMFE#1=2.67 NMFL2 = 0.0 NMME#1=10.0 NMHD = 81.0

RDNO+		RDNO-		RDNO+		RDNO-		RDNO+		RDNO-		RDNO+		RDNO-	
H	N	NE	SW	TN	TE	TI	TE/TI	H	N	NE	SW	TN	TE	TI	TE/TI
80.0	5.666%	0.08	0.0012	-1	-1	-1	-1	85.0	1.130%	0.09	0.0025	-1	-1	-1	-1
90.0	1.312%	10	0.0286	-1	-1	-1	-1	95.0	5.386%	10	0.1174	-1	-1	-1	-1
100.0	1.037%	11	0.2261	-1	-1	-1	-1	105.0	1.277%	11	0.2784	-1	-1	-1	-1
110.0	1.307%	11	0.2849	-1	-1	-1	-1	115.0	1.330%	11	0.2899	-1	-1	-1	-1
120.0	1.343%	11	0.2927	-1	-1	-1	-1	125.0	1.356%	11	0.2956	-1	-1	-1	-1
130.0	1.370%	11	0.2986	-1	-1	-1	-1	135.0	1.384%	11	0.3017	-1	-1	-1	-1
140.0	1.398%	11	0.3048	-1	-1	-1	-1	150.0	1.428%	11	0.3113	-1	-1	-1	-1
160.0	1.460%	11	0.3182	-1	-1	-1	-1	170.0	1.493%	11	0.3255	-1	-1	-1	-1
180.0	1.529%	11	0.3333	-1	-1	-1	-1	190.0	1.567%	11	0.3416	-1	-1	-1	-1
200.0	1.608%	11	0.3506	-1	-1	-1	-1	210.0	1.654%	11	0.3605	-1	-1	-1	-1
220.0	1.704%	11	0.3715	-1	-1	-1	-1	230.0	1.762%	11	0.3841	-1	-1	-1	-1
240.0	1.830%	11	0.3990	-1	-1	-1	-1	260.0	2.065%	11	0.4501	-1	-1	-1	-1
280.0	2.925%	11	0.6378	-1	-1	-1	-1	300.0	3.703%	11	0.8072	-1	-1	-1	-1
320.0	4.248%	11	0.9262	-1	-1	-1	-1	340.0	4.525%	11	0.9865	-1	-1	-1	-1
360.0	4.585%	11	0.9996	-1	-1	-1	-1	380.0	4.435%	11	0.9669	-1	-1	-1	-1
400.0	4.085%	11	0.8905	-1	-1	-1	-1	420.0	3.611%	11	0.7873	-1	-1	-1	-1
440.0	3.092%	11	0.6741	-1	-1	-1	-1	460.0	2.589%	11	0.5644	-1	-1	-1	-1
480.0	2.139%	11	0.4663	-1	-1	-1	-1	500.0	1.758%	11	0.3834	-1	-1	-1	-1
520.0	1.448%	11	0.3158	-1	-1	-1	-1	540.0	1.202%	11	0.2620	-1	-1	-1	-1
560.0	1.009%	11	0.2199	-1	-1	-1	-1	580.0	8.585%	10	0.1872	-1	-1	-1	-1
600.0	7.419%	10	0.1617	-1	-1	-1	-1	620.0	6.512%	10	0.1420	-1	-1	-1	-1
640.0	5.804%	10	0.1265	-1	-1	-1	-1	660.0	5.249%	10	0.1144	-1	-1	-1	-1
680.0	4.812%	10	0.1049	-1	-1	-1	-1	700.0	4.464%	10	0.0973	-1	-1	-1	-1
720.0	4.187%	10	0.0913	-1	-1	-1	-1	740.0	3.964%	10	0.0864	-1	-1	-1	-1
760.0	3.785%	10	0.0794	-1	-1	-1	-1	780.0	3.640%	10	0.0768	-1	-1	-1	-1
800.0	3.522%	10	0.0768	-1	-1	-1	-1	850.0	3.333%	10	0.0759	-1	-1	-1	-1
890.0	3.111%	9	0.0750	-1	-1	-1	-1	930.0	2.888%	9	0.0741	-1	-1	-1	-1
970.0	2.640%	9	0.0732	-1	-1	-1	-1	1010.0	2.388%	9	0.0723	-1	-1	-1	-1
1050.0	2.139%	9	0.0714	-1	-1	-1	-1	1130.0	1.888%	9	0.0705	-1	-1	-1	-1
1210.0	1.635%	9	0.0696	-1	-1	-1	-1	1310.0	1.388%	9	0.0687	-1	-1	-1	-1
1410.0	1.058%	9	0.0678	-1	-1	-1	-1	1510.0	0.768%	9	0.0669	-1	-1	-1	-1
1610.0	0.479%	9	0.0660	-1	-1	-1	-1	1710.0	0.488%	9	0.0651	-1	-1	-1	-1
1810.0	0.198%	9	0.0642	-1	-1	-1	-1	1910.0	0.108%	9	0.0633	-1	-1	-1	-1
2010.0	0.008%	9	0.0624	-1	-1	-1	-1	2110.0	-0.081%	9	0.0615	-1	-1	-1	-1
2210.0	-0.371%	9	0.0606	-1	-1	-1	-1	2310.0	-0.761%	9	0.0597	-1	-1	-1	-1
2410.0	-1.151%	9	0.0588	-1	-1	-1	-1	2510.0	-1.541%	9	0.0579	-1	-1	-1	-1
2610.0	-1.931%	9	0.0570	-1	-1	-1	-1	2710.0	-2.321%	9	0.0561	-1	-1	-1	-1
2810.0	-2.721%	9	0.0552	-1	-1	-1	-1	2910.0	-3.111%	9	0.0543	-1	-1	-1	-1
3010.0	-3.501%	9	0.0544	-1	-1	-1	-1	3110.0	-3.891%	9	0.0535	-1	-1	-1	-1
3210.0	-4.281%	9	0.0526	-1	-1	-1	-1	3310.0	-4.671%	9	0.0517	-1	-1	-1	-1
3410.0	-5.061%	9	0.0508	-1	-1	-1	-1	3510.0	-5.451%	9	0.0500	-1	-1	-1	-1
3610.0	-5.841%	9	0.0491	-1	-1	-1	-1	3710.0	-6.231%	9	0.0483	-1	-1	-1	-1
3810.0	-6.631%	9	0.0474	-1	-1	-1	-1	3910.0	-7.021%	9	0.0465	-1	-1	-1	-1
4010.0	-7.411%	9	0.0456	-1	-1	-1	-1	4110.0	-7.799%	9	0.0447	-1	-1	-1	-1
4210.0	-8.189%	9	0.0438	-1	-1	-1	-1	4310.0	-8.589%	9	0.0429	-1	-1	-1	-1
4410.0	-8.979%	9	0.0420	-1	-1	-1	-1	4510.0	-9.369%	9	0.0411	-1	-1	-1	-1
4610.0	-9.759%	9	0.0403	-1	-1	-1	-1	4710.0	-10.149%	9	0.0394	-1	-1	-1	-1
4810.0	-10.539%	9	0.0386	-1	-1	-1	-1	4910.0	-10.929%	9	0.0377	-1	-1	-1	-1
5010.0	-11.319%	9	0.0370	-1	-1	-1	-1	5110.0	-11.709%	9	0.0361	-1	-1	-1	-1
5210.0	-12.099%	9	0.0354	-1	-1	-1	-1	5310.0	-12.489%	9	0.0345	-1	-1	-1	-1
5410.0	-12.879%	9	0.0337	-1	-1	-1	-1	5510.0	-13.269%	9	0.0328	-1	-1	-1	-1
5610.0	-13.659%	9	0.0320	-1	-1	-1	-1	5710.0	-14.049%	9	0.0311	-1	-1	-1	-1
5810.0	-14.439%	9	0.0303	-1	-1	-1	-1	5910.0	-14.829%	9	0.0294	-1	-1	-1	-1
6010.0	-15.219%	9	0.0296	-1	-1	-1	-1	6110.0	-15.609%	9	0.0286	-1	-1	-1	-1
6210.0	-16.000%	9	0.0280	-1	-1	-1	-1	6310.0	-16.390%	9	0.0271	-1	-1	-1	-1
6410.0	-16.780%	9	0.0264	-1	-1	-1	-1	6510.0	-17.170%	9	0.0255	-1	-1	-1	-1
6610.0	-17.560%	9	0.0258	-1	-1	-1	-1	6710.0	-17.950%	9	0.0250	-1	-1	-1	-1
6810.0	-18.340%	9	0.0252	-1	-1	-1	-1	6910.0	-18.730%	9	0.0243	-1	-1	-1	-1
7010.0	-19.120%	9	0.0245	-1	-1	-1	-1	7110.0	-19.510%	9	0.0235	-1	-1	-1	-1
7210.0	-19.900%	9	0.0238	-1	-1	-1	-1	7310.0	-20.290%	9	0.0229	-1	-1	-1	-1
7410.0	-20.680%	9	0.0231	-1	-1	-1	-1	7510.0	-21.070%	9	0.0221	-1	-1	-1	-1
7610.0	-21.460%	9	0.0224	-1	-1	-1	-1	7710.0	-21.850%	9	0.0214	-1	-1	-1	-1
7810.0	-22.240%	9	0.0227	-1	-1	-1	-1	7910.0	-22.630%	9	0.0215	-1	-1	-1	-1
8010.0	-22.920%	9	0.0230	-1	-1	-1	-1	8110.0	-23.310%	9	0.0223	-1	-1	-1	-1
8210.0	-23.700%	9	0.0233	-1	-1	-1	-1	8310.0	-24.090%	9	0.0225	-1	-1	-1	-1
8410.0	-24.480%	9	0.0236	-1	-1	-1	-1	8510.0	-24.870%	9	0.0227	-1	-1	-1	-1
8610.0	-25.260%	9	0.0239	-1	-1	-1	-1	8710.0	-25.650%	9	0.0229	-1	-1	-1	-1
8810.0	-26.040%	9	0.0242	-1	-1	-1	-1	8910.0	-26.430%	9	0.0231	-1	-1	-1	-1
9010.0	-26.820%	9	0.0245	-1	-1	-1	-1	9110.0	-27.210%	9	0.0233	-1	-1	-1	-1
9210.0	-27.600%	9	0.0248	-1	-1	-1	-1	9310.0	-28.000%	9	0.0235	-1	-1	-1	-1
9410.0	-28.390%	9	0.0251	-1	-1	-1	-1	9510.0	-28.790%	9	0.0243	-1	-1	-1	-1
9610.0	-29.180%	9	0.0254	-1	-1	-1	-1	9710.0	-29.580%	9	0.0241	-1	-1	-1	-1
9810.0	-29.970%	9	0.0257	-1	-1	-1	-1	9910.0	-30.370%	9	0.0239	-1	-1	-1	-1
10010.0	-30.760%	9	0.0260	-1	-1	-1	-1	10110.0	-31.160%	9	0.0249	-1	-1	-1	-1
10210.0	-31.550%	9	0.0263	-1	-1	-1	-1	10310.0	-31.950%	9	0.0247	-1	-1	-1	-1
10410.0	-32.340%	9	0.0266	-1	-1	-1	-1	10510.0	-32.740%	9	0.0245	-1	-1	-1	-1
10610.0	-33.130%	9	0.0269	-1	-1	-1	-1	10710.0	-33.530%	9	0.0243	-1	-1	-1	-1
10810.0	-33.920%	9	0.0272	-1	-1	-1	-1	10910.0	-34.320%	9	0.0241	-1	-1	-1	-1
11010.0	-34.710%	9	0.0275	-1	-1	-1	-1	11110.0	-35.110%	9	0.0239	-1	-1	-1	-1
11210.0	-35.500%	9	0.0278	-1	-1	-1	-1	11310.0	-35.900%	9	0.0237	-1	-1	-1	-1
11410.0	-36.290%	9	0.0281	-1	-1	-1	-1	11510.0	-36.690%	9	0.0235	-1	-1	-1	-1
11610.0	-37.080%	9	0.0284	-1	-1	-1	-1	11710.0	-37.480%	9	0.0233	-1	-1	-1	-1
11810.0	-37.870%	9	0.0287	-1	-1	-1	-1	11910.0	-38.270%	9	0.0231	-1	-1	-1	-1
12010.0	-38.660%	9	0.0290	-1	-1	-1	-1	12110.0	-39.060%	9	0.0229	-1	-1	-1	-1
12210.0	-39.450%	9	0.0293	-1	-1	-1	-1	12310.0	-39.850%	9	0.0227	-1	-1	-1	-1
12410.0	-40.240%	9	0.0296	-1	-1	-1	-1	12510.0	-40.640%	9	0.0226	-1	-1	-1	-1
12610.0	-41.030%	9	0.0299	-1	-1	-1	-1	12710.0	-41.430%	9	0.0224	-1	-1	-1	-1
12810.0	-41.820%	9	0.0302	-1	-1	-1	-1	12910.0	-42.220%	9	0.0222	-1	-1	-1	-1
13010.0	-42.610%	9	0.0305	-1	-1	-1	-1	13110.0	-43.010%	9	0.0221	-1	-1	-1	-1
13210.0	-43.400%	9	0.0308	-1	-1	-1	-1	13310.0	-43.800%	9	0.0220	-1	-1	-1	-1
13410.0	-44.190%	9</													

INPUT: LATI = -12.0 LONGI = 263.1 R = 10 MONTH = 6 HUR = 6.3

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MDIP= 2.8 MAGLA= 1.4 XHI= 90.0
 SUNRISE: 6:03 L.T. SUNSET: 17:7 L.T. SUN DEC.= 23.
 NMF2=1.38%11 HMF1= 0.00% -01 NME= 2.78%10 NMHD=4.00%08
 HMF2=262.6 HMF1= 0.0 HME=107.5 HMD= 84.5

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INPUT: LAT= -12.0 LONG= 283.1 R= 10 MONTH= 6 HOUR= 0.0

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CALCULATED VALUES: HLAT = -0.7 MLNG = 353.1
 DIP = 2.7 MDIP = 2.3 MAGLA = 1.4 XHI = 168.9
 SUNSE: 6.3 L.T. SUNSET:17.7 L.T. SUN DEC = 23.1
 NMFR2= 2.14% NMFL1= 0.00% NMFE1= 1.78% NMFD= 4.00%
 HMF2=271.4 HMF1= 0.0 HME=105.0 HMD = 88.0

INPUT: LATI= -12.0 LONGI= 283.1 R = 10 MONTH=12 HOUR=12

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MODIP= 2.8 MAGLA= 1.4 XHII= 10.9
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC= -22.9
 NMF2=9.12%11 NMFL1= 2.46%11 NMME=1.47%11 NMD=6.24%08
 HMF2=369.6 HMF1=300.6 HME=110.0 HMD= 81.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDHE+	RDD2+	RDNN+
80.0	6.063%08	6.6%4	-1	-1	-1	-1	-1	-1	-1
85.0	1.222%09	0.0013	-1	-1	-1	-1	-1	-1	-1
90.0	1.425%10	0.0156	-1	-1	-1	-1	-1	-1	-1
95.0	5.917%10	0.0649	-1	-1	-1	-1	-1	-1	-1
100.0	1.153%11	0.1265	-1	-1	-1	0.244	0.000	0.000	0.000
105.0	1.430%11	0.1569	-1	-1	-1	0.351	0.000	0.000	0.000
110.0	0.1466%11	0.1608	-1	-1	-1	0.504	0.000	0.000	0.000
115.0	0.1467%11	0.1608	-1	-1	-1	0.723	0.000	0.000	0.000
120.0	0.1472%11	0.1614	308.2	308.2	1.0000	1.034	0.000	0.000	0.000
125.0	0.1477%11	0.1620	356.0	389.2	1.0928	1.472	0.000	0.000	0.000
130.0	0.1483%11	0.1626	402.5	468.6	402.5	1.1642	2.081	0.000	0.000
135.0	0.1489%11	0.1633	446.4	545.5	446.4	1.2221	2.907	0.000	0.000
140.0	0.1495%11	0.1639	485.9	618.0	485.9	1.2720	3.988	0.000	0.000
150.0	0.1507%11	0.1652	549.8	748.0	549.8	1.3606	6.891	0.000	0.000
160.0	0.1520%11	0.1666	596.2	860.5	596.2	1.4433	10.267	0.000	0.000
170.0	0.1533%11	0.1681	630.2	960.6	630.2	1.5243	13.474	0.000	0.000
180.0	0.1547%11	0.1697	655.9	1052.4	655.9	1.6044	16.515	0.000	0.000
190.0	0.1563%11	0.1714	676.0	1138.5	676.0	1.6843	19.690	0.000	0.000
200.0	0.1579%11	0.1732	691.9	1220.6	691.9	1.7640	23.244	0.000	0.000
210.0	0.1597%11	0.1751	704.9	1397.0	704.9	1.9818	27.350	0.000	0.000
220.0	0.1616%11	0.1772	715.5	1591.7	715.5	2.2245	32.145	0.000	0.000
230.0	0.1636%11	0.1795	724.3	1794.8	724.3	2.4773	37.767	0.000	0.000
240.0	0.1659%11	0.1820	731.5	1990.5	733.3	2.7147	44.366	0.000	0.000
260.0	0.1715%11	0.1881	742.6	2278.2	750.8	3.0344	61.210	0.000	0.000
280.0	1.798%11	0.1972	750.3	2317.5	768.3	3.0163	83.617	0.000	0.000
300.0	2.431%11	0.2666	755.6	2108.9	785.9	2.6835	98.000	0.000	0.000
320.0	5.151%11	0.5649	759.4	1789.7	803.4	2.2276	96.732	2.337	0.000
340.0	7.786%11	0.8538	762.1	1498.9	821.2	1.8254	93.413	5.757	0.000
360.0	9.013%11	0.9884	764.1	1295.8	839.3	1.5439	90.144	6.822	0.000
380.0	9.040%11	0.9914	765.5	1178.6	858.6	1.3726	86.988	11.698	0.000
400.0	8.494%11	0.9315	766.6	1124.0	880.9	1.2759	83.940	14.450	0.000
420.0	7.570%11	0.8302	767.4	1109.2	909.4	1.2198	80.998	17.100	1.900
440.0	6.465%11	0.7090	768.0	1118.3	947.1	1.1807	78.157	19.658	2.184
460.0	5.350%11	0.5867	768.5	1141.0	994.0	1.1478	75.413	22.129	2.459
480.0	4.337%11	0.4757	768.8	1171.3	1046.6	1.1191	72.760	24.516	2.724
500.0	3.482%11	0.3818	769.1	1205.9	1101.5	1.0948	70.194	26.825	2.981
520.0	2.792%11	0.3062	769.4	1242.9	1156.6	1.0746	67.709	29.062	3.229
540.0	2.253%11	0.2471	769.6	1281.2	1210.8	1.0581	65.300	31.230	3.470
560.0	1.840%11	0.2018	769.7	1320.2	1263.5	1.0449	62.958	33.338	3.704
580.0	1.526%11	0.1673	769.8	1359.6	1314.3	1.0345	60.675	35.392	3.932
600.0	1.287%11	0.1412	769.9	1399.2	1363.2	1.0264	58.442	37.402	4.156
620.0	1.106%11	0.1213	770.0	1438.9	1410.1	1.0204	56.247	39.378	4.375
640.0	9.677%10	0.1061	770.1	1478.7	1455.4	1.0160	54.079	41.329	4.592
660.0	8.613%10	0.0945	770.2	1518.5	1499.3	1.0128	51.927	43.265	4.807
680.0	7.788%10	0.0854	770.2	1558.3	1542.0	1.0106	49.786	45.193	5.021
700.0	7.144%10	0.0783	770.3	1598.2	1583.9	1.0090	47.653	47.112	5.235
720.0	6.638%10	0.0728	770.3	1638.0	1625.1	1.0079	45.534	49.019	5.447
740.0	6.237%10	0.0684	770.3	1677.9	1665.9	1.0072	43.440	50.904	5.656
760.0	5.918%10	0.0649	770.4	1717.7	1706.5	1.0066	41.383	52.755	5.862
780.0	5.663%10	0.0621	770.4	1746.8	1746.8	1.0062	39.379	54.559	6.062
800.0	5.457%10	0.0598	770.4	1797.4	1786.9	1.0059	37.437	56.316	6.256

WE PUT H1= 3.0TU GET HST

INPUT: LAT = -12.0 LONGI = 233.1 R = 10 MONTH=12 HOUR = 5.7

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MDIP= 2.8 MAGLA= 1.4 XHI= 90.0
 SUNRISE: 5:7 L.T. SUNSET: 18:3 L.T. SUN DEC.= -22.9
 NMIF1= 0.73% NMIF1= 0.00%-01 NMIE2= 77%10 NMID=4, 00%08
 CHI2= 260.0 HME1= 0.0 HME=107.5 HMD= 84.5

TE/TI		RDH+		RDH+		RDH+	
TE	T1	-1	-1	-1	-1	-1	-1
N/HMAX	NE	-1	-1	-1	-1	-1	-1
80.0	2.914%08	0.0017	0.0024	0.0024	0.0024	0.0024	0.0024
85.0	4.081%08	0.0017	0.0024	0.0024	0.0024	0.0024	0.0024
90.0	1.836%09	0.0016	0.0023	0.0023	0.0023	0.0023	0.0023
95.0	1.145%10	0.0016	0.0023	0.0023	0.0023	0.0023	0.0023
00.0	2.357%10	0.0016	0.0023	0.0023	0.0023	0.0023	0.0023
05.0	2.756%10	0.0016	0.0023	0.0023	0.0023	0.0023	0.0023
10.0	2.667%10	0.0016	0.0023	0.0023	0.0023	0.0023	0.0023
15.0	2.148%10	0.1243	0.1243	0.1243	0.1243	0.1243	0.1243
20.0	0.704%10	0.0986	0.0986	0.0986	0.0986	0.0986	0.0986
25.0	1.684%10	0.0974	0.0974	0.0974	0.0974	0.0974	0.0974
30.0	2.126%10	0.1230	0.1230	0.1230	0.1230	0.1230	0.1230
35.0	2.724%10	0.156	0.156	0.156	0.156	0.156	0.156
40.0	2.979%10	0.1722	0.1722	0.1722	0.1722	0.1722	0.1722
45.0	50.0	0.326%10	0.1924	0.1924	0.1924	0.1924	0.1924
50.0	9.945%10	0.5753	0.5753	0.5753	0.5753	0.5753	0.5753
55.0	60.0	2.755%10	0.2172	0.2172	0.2172	0.2172	0.2172
60.0	10.0	2.626%11	0.7297	0.7297	0.7297	0.7297	0.7297
65.0	70.0	4.312%10	0.2494	0.2494	0.2494	0.2494	0.2494
70.0	80.0	5.139%10	0.2973	0.2973	0.2973	0.2973	0.2973
75.0	90.0	7.152%10	0.4137	0.4137	0.4137	0.4137	0.4137
80.0	90.0	0.9879	0.6062	0.6062	0.6062	0.6062	0.6062
85.0	90.0	1.708%11	0.9879	0.9879	0.9879	0.9879	0.9879
90.0	90.0	1.720%11	0.9949	0.9949	0.9949	0.9949	0.9949
95.0	90.0	1.654%11	0.9568	0.9568	0.9568	0.9568	0.9568
00.0	10.0	2.20%11	0.480%11	0.480%11	0.480%11	0.480%11	0.480%11
05.0	30.0	1.630%11	0.9429	0.9429	0.9429	0.9429	0.9429
10.0	40.0	1.708%11	0.9879	0.9879	0.9879	0.9879	0.9879
15.0	50.0	1.720%11	0.9949	0.9949	0.9949	0.9949	0.9949
20.0	60.0	1.654%11	0.9568	0.9568	0.9568	0.9568	0.9568
25.0	70.0	1.536%11	0.8887	0.8887	0.8887	0.8887	0.8887
30.0	80.0	1.385%11	0.0012	0.0012	0.0012	0.0012	0.0012
35.0	90.0	1.219%11	0.7050	0.7050	0.7050	0.7050	0.7050
40.0	100.0	1.053%11	0.6092	0.6092	0.6092	0.6092	0.6092
45.0	110.0	0.898%10	0.5199	0.5199	0.5199	0.5199	0.5199
50.0	120.0	0.761%10	0.4405	0.4405	0.4405	0.4405	0.4405
55.0	130.0	0.642%10	0.3724	0.3724	0.3724	0.3724	0.3724
60.0	140.0	0.545%10	0.3154	0.3154	0.3154	0.3154	0.3154
65.0	150.0	0.464%10	0.2685	0.2685	0.2685	0.2685	0.2685
70.0	160.0	0.395%10	0.2304	0.2304	0.2304	0.2304	0.2304
75.0	170.0	0.348%10	0.1996	0.1996	0.1996	0.1996	0.1996
80.0	180.0	0.348%10	0.1747	0.1747	0.1747	0.1747	0.1747
85.0	190.0	0.201%10	0.1547	0.1547	0.1547	0.1547	0.1547
90.0	200.0	2.674%10	0.1385	0.1385	0.1385	0.1385	0.1385
95.0	210.0	0.608%10	0.0930	0.0930	0.0930	0.0930	0.0930
00.0	220.0	2.168%10	0.1254	0.1254	0.1254	0.1254	0.1254
05.0	230.0	3.450%10	0.0882	0.0882	0.0882	0.0882	0.0882
10.0	240.0	6.437%10	0.0841	0.0841	0.0841	0.0841	0.0841
15.0	250.0	3.021%10	0.1060	0.1060	0.1060	0.1060	0.1060
20.0	260.0	1.833%10	0.1270	0.1270	0.1270	0.1270	0.1270
25.0	270.0	1.396%10	0.0989	0.0989	0.0989	0.0989	0.0989
30.0	280.0	1.710%10	0.0780	0.0780	0.0780	0.0780	0.0780
35.0	290.0	0.737%10	0.0736	0.0736	0.0736	0.0736	0.0736
40.0	300.0	1.244%10	0.0721	0.0721	0.0721	0.0721	0.0721

INPUT: LAT= -12.0 LONG= 253.1 RE= 10 MUNTH=12 HHR= 0.0

CALCULATED VALUES: 'LAT= -0.7 MLG= 353.1
 DIP= 2.7 MDIP= 2.8 MAGLA= 1.4 XHI= 145.1
 SUNRISE: 5.7 L.T. SUMSET:18.3 L.T. SJN DEC.= -22.9
 NSF2=2.57%11 HMF1= 0.00%-61 HME=1.78%09 NHD=4.00%08
 HF2=219.7 Ht,F1= 0.0 HME=105.0 HMD= 88.0

H	NE	N/LMAX	TN	TE	T1	TE/T1	RDN+	RDHE+	RDN2+	RDHE2+	RDN0+	RDHE0+
80.0	5.826%	05	2.3%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.490%	08	9.7%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.736%	08	0.9018	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.743%	09	0.0069	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.775%	09	0.0069	-1	-1	-1	0.001	0.000	0.000	0.000	0.000	0.000
105.0	1.775%	09	0.0069	-1	-1	-1	0.002	0.000	0.000	0.000	0.000	0.000
110.0	1.500%	09	0.9059	-1	-1	-1	0.004	0.000	0.000	0.000	0.000	0.000
115.0	1.019%	09	0.0040	-1	-1	-1	0.009	0.000	0.000	0.000	0.000	0.000
120.0	6.516%	08	0.0025	286.3	286.3	1.0000	0.017	0.000	0.000	0.000	0.000	0.000
125.0	4.451%	08	0.0017	325.7	325.7	1.0158	0.032	0.000	0.000	0.000	0.000	0.000
130.0	3.553%	08	0.0014	363.9	363.9	1.0283	0.060	0.000	0.000	0.000	0.000	0.000
135.0	3.488%	08	0.0014	399.2	399.2	1.0387	0.115	0.000	0.000	0.000	0.000	0.000
140.0	4.253%	08	0.0017	429.7	429.7	1.0479	0.216	0.000	0.000	0.000	0.000	0.000
150.0	1.007%	09	0.0039	507.2	476.3	1.0648	0.724	0.000	0.000	0.000	0.000	0.000
160.0	2.345%	09	0.0091	549.1	507.9	1.0810	2.098	0.000	0.000	0.000	0.000	0.000
170.0	5.284%	09	0.0205	530.0	531.4	1.0971	4.696	0.000	0.000	0.000	0.000	0.000
180.0	1.136%	10	0.0441	546.2	607.9	1.1130	7.945	0.000	0.000	0.000	0.000	0.000
190.0	2.320%	10	0.0902	558.5	630.5	1.1254	11.196	0.000	0.000	0.000	0.000	0.000
200.0	4.418%	10	0.1717	568.2	650.5	1.1325	14.527	0.000	0.000	0.000	0.000	0.000
210.0	7.454%	10	0.2896	576.1	668.6	1.1361	18.282	0.000	0.000	0.000	0.000	0.000
220.0	1.123%	11	0.4364	582.4	685.3	1.1371	22.765	0.000	0.000	0.000	0.000	0.000
230.0	1.532%	11	0.9593	587.7	700.8	1.1363	28.250	0.000	0.000	0.000	0.000	0.000
240.0	1.916%	11	0.7446	592.0	715.4	1.1340	35.014	0.000	0.000	0.000	0.000	0.000
260.0	2.437%	11	0.9471	598.5	742.6	1.1266	53.731	0.000	0.000	0.000	0.000	0.000
280.0	2.574%	11	1.0000	603.1	767.7	1.1168	81.303	0.000	0.000	0.000	0.000	0.000
300.0	2.516%	11	0.9775	606.2	791.4	1.1060	98.000	0.000	0.000	0.000	0.000	0.000
320.0	2.361%	11	0.9173	608.5	814.3	1.0948	86.924	11.221	1.247	0.012	0.596	0.000
340.0	2.139%	11	0.9173	613.2	900.7	1.0737	74.177	23.086	1.882	0.003	0.169	0.000
360.0	1.882%	11	0.7313	611.2	836.4	1.0733	63.731	0.000	0.000	0.533	45.737	0.000
380.0	1.620%	11	0.6293	612.1	858.2	799.5	63.254	0.000	0.000	0.151	18.541	0.000
400.0	1.372%	11	0.5332	612.7	879.6	826.4	53.956	41.427	4.603	0.000	0.14	1.957
420.0	1.152%	11	0.4476	613.2	900.7	851.2	46.047	4.8.554	5.395	0.000	0.004	0.000
440.0	9.640%	10	0.3746	613.5	900.8	886.0	1.0167	39.325	54.606	6.067	0.000	0.001
460.0	8.079%	10	0.1000	613.8	900.8	893.8	1.0079	28.783	33.028	3.670	0.001	0.048
480.0	6.808%	10	0.2645	614.0	901.0	897.4	1.0040	24.692	67.777	7.531	0.000	0.014
500.0	5.786%	10	0.2248	614.2	901.1	898.9	1.0024	21.241	70.883	7.876	0.000	0.000
520.0	4.969%	10	0.1931	614.4	901.2	899.6	1.0015	18.337	73.97	8.166	0.000	0.000
540.0	4.319%	10	0.1678	614.5	901.3	899.9	1.0016	15.900	59.742	6.638	0.000	0.000
560.0	3.801%	10	0.1477	614.6	901.5	900.1	1.0015	13.857	64.095	8.410	0.000	0.000
580.0	3.388%	10	0.1316	614.6	901.6	900.3	1.0015	12.144	77.528	8.614	0.000	0.000
600.0	3.056%	10	0.1183	614.7	901.8	900.4	1.0015	10.701	79.071	8.786	0.000	0.000
620.0	2.789%	10	0.0830	614.9	902.4	901.1	1.0015	9.478	81.470	9.052	0.000	0.000
640.0	2.573%	10	0.1000	614.8	902.0	900.7	1.0015	8.431	82.412	9.157	0.000	0.000
660.0	2.398%	10	0.0932	614.8	902.2	900.8	1.0015	7.527	83.226	9.247	0.000	0.000
680.0	2.255%	10	0.0876	614.9	902.3	901.0	1.0015	6.738	83.936	9.326	0.000	0.000
700.0	2.137%	10	0.0830	614.9	902.4	901.1	1.0015	6.044	84.560	9.396	0.000	0.000
720.0	2.040%	10	0.0793	614.9	902.6	901.3	1.0015	5.430	85.113	9.457	0.000	0.000
740.0	1.960%	10	0.0762	614.9	902.7	901.4	1.0015	4.883	85.606	9.512	0.000	0.000
760.0	1.894%	10	0.0736	615.0	902.9	901.5	1.0015	4.394	86.046	9.561	0.000	0.000
780.0	1.839%	10	0.0714	615.0	903.0	901.7	1.0015	3.956	86.440	9.604	0.000	0.000
800.0	1.793%	10	0.0697	615.0	903.1	901.8	1.0015	3.563	86.794	9.644	0.000	0.000
WE PUT B1= 3.0TU GET HST												

INPUT: LATI= -12.0 LONGI= 283.1 R=100 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MNDDIP= 2.8 MAGLA= 1.4 XHII= 8.7
 SUNRISE: 6.0 L.T. SUNSET: 18.0 L.T. SUN DEC. = -3.3
 NMF2=1.48%12 NMFI1= 3.56%11 NMID=1.34%09
 NMF2=443.8 HMF1=333.5 HME=110.0 HMD= 81.0

H	NE	TN	TE	T1	TE/T1	RDD+	RDH+	RDHE+	RDD2+	RDN0+
80.0	1.301%09	-0.7	MLNG= 353.1	-1	-1	-1	-1	-1	-1	-1
85.0	2.613%09	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.826%10	0.0018	-1	-1	-1	-1	-1	-1	-1	-1
95.0	9.843%10	0.0190	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.641%11	0.0663	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.879%11	0.1106	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.901%11	0.1266	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.916%11	0.1280	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.924%11	0.1291	-1	-1	-1	-1	-1	-1	-1	-1
125.0	1.932%11	0.1296	-1	-1	-1	-1	-1	-1	-1	-1
130.0	1.939%11	0.1301	-1	-1	-1	-1	-1	-1	-1	-1
135.0	1.947%11	0.1307	-1	-1	-1	-1	-1	-1	-1	-1
140.0	1.956%11	0.1312	-1	-1	-1	-1	-1	-1	-1	-1
145.0	1.965%11	0.1317	-1	-1	-1	-1	-1	-1	-1	-1
150.0	1.972%11	0.1329	-1	-1	-1	-1	-1	-1	-1	-1
160.0	1.990%11	0.1341	-1	-1	-1	-1	-1	-1	-1	-1
170.0	2.008%11	0.1353	-1	-1	-1	-1	-1	-1	-1	-1
180.0	2.028%11	0.1366	-1	-1	-1	-1	-1	-1	-1	-1
190.0	2.048%11	0.1380	-1	-1	-1	-1	-1	-1	-1	-1
200.0	2.069%11	0.1394	-1	-1	-1	-1	-1	-1	-1	-1
210.0	2.092%11	0.1409	-1	-1	-1	-1	-1	-1	-1	-1
220.0	2.116%11	0.1426	-1	-1	-1	-1	-1	-1	-1	-1
230.0	2.142%11	0.1443	-1	-1	-1	-1	-1	-1	-1	-1
240.0	2.170%11	0.1462	-1	-1	-1	-1	-1	-1	-1	-1
260.0	2.234%11	0.1505	-1	-1	-1	-1	-1	-1	-1	-1
280.0	2.312%11	0.1558	-1	-1	-1	-1	-1	-1	-1	-1
300.0	2.419%11	0.1630	-1	-1	-1	-1	-1	-1	-1	-1
320.0	2.663%11	0.1794	-1	-1	-1	-1	-1	-1	-1	-1
340.0	4.384%11	0.2953	-1	-1	-1	-1	-1	-1	-1	-1
360.0	7.362%11	0.4960	-1	-1	-1	-1	-1	-1	-1	-1
380.0	1.044%12	0.7036	-1	-1	-1	-1	-1	-1	-1	-1
400.0	1.291%12	0.6700	-1	-1	-1	-1	-1	-1	-1	-1
420.0	1.436%12	0.9674	-1	-1	-1	-1	-1	-1	-1	-1
440.0	1.483%12	0.9994	-1	-1	-1	-1	-1	-1	-1	-1
460.0	1.452%12	0.9779	-1	-1	-1	-1	-1	-1	-1	-1
480.0	1.333%12	0.8978	-1	-1	-1	-1	-1	-1	-1	-1
500.0	1.157%12	0.7797	-1	-1	-1	-1	-1	-1	-1	-1
520.0	9.614%11	0.6474	-1	-1	-1	-1	-1	-1	-1	-1
540.0	7.731%11	0.5208	-1	-1	-1	-1	-1	-1	-1	-1
560.0	6.093%11	0.4105	-1	-1	-1	-1	-1	-1	-1	-1
580.0	4.758%11	0.3206	-1	-1	-1	-1	-1	-1	-1	-1
600.0	3.718%11	0.2505	-1	-1	-1	-1	-1	-1	-1	-1
620.0	2.928%11	0.1973	-1	-1	-1	-1	-1	-1	-1	-1
640.0	2.337%11	0.1575	-1	-1	-1	-1	-1	-1	-1	-1
660.0	1.898%11	0.1278	-1	-1	-1	-1	-1	-1	-1	-1
680.0	1.570%11	0.1058	-1	-1	-1	-1	-1	-1	-1	-1
700.0	1.326%11	0.0893	-1	-1	-1	-1	-1	-1	-1	-1
720.0	1.141%11	0.0769	-1	-1	-1	-1	-1	-1	-1	-1
740.0	1.000%11	0.0674	-1	-1	-1	-1	-1	-1	-1	-1
760.0	8.922%10	0.0601	-1	-1	-1	-1	-1	-1	-1	-1
780.0	8.084%10	0.0545	-1	-1	-1	-1	-1	-1	-1	-1
800.0	7.428%10	0.0500	-1	-1	-1	-1	-1	-1	-1	-1

WE PUT B1= 3.070 GET HST

INPUT: LATI= -12.0 LONGI= 283.1 R=100 MONTH= 3 HOUR= 6.0

CALCULATED VALUES: MLAT= -0.7 MLAGL= 1.4 XHI= 90.0

DTP= 2.7 MODIP= 2.8 SUNSET:18.0 L.T. SUN DEC= -3.3

SUNRISE: 6.0 L.T. NMF1= 0.00% NME= 3.57% NMD= 4.00% HMD= 84.5

NMF2= 3.88% NME11= 0.00% HMF1= 0.0 HME= 107.5 HMD= 84.5

H N/HMAX N/HMAX

		NE	TN	TE	T1	TE/T1	RDD+	RDD2+	RDH+	RDH2+	RDN+	RDN2+
80.0	2.914%	0.8	7.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.081%	0.8	0.0011	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.842%	0.9	0.0047	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.254%	1.0	0.0323	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.880%	1.0	0.0742	-1	-1	-1	-1	-1	0.012	0.000	18.284	81.704
105.0	3.546%	1.0	0.0914	-1	-1	-1	-1	-1	0.019	0.000	21.005	78.976
110.0	3.441%	1.0	0.0887	-1	-1	-1	-1	-1	0.030	0.000	24.068	75.901
115.0	2.772%	1.0	0.0715	-1	-1	-1	-1	-1	0.049	0.000	27.398	72.553
120.0	2.199%	1.0	0.0567	319.7	319.7	1.00000	0.079	0.000	0.000	0.000	30.398	69.191
125.0	2.173%	1.0	0.0560	371.9	386.1	1.0381	0.127	0.000	0.000	0.000	33.564	66.309
130.0	2.741%	1.0	0.0707	422.8	451.1	1.0670	0.205	0.000	0.000	0.000	35.472	64.323
135.0	3.515%	1.0	0.0906	471.3	513.8	1.0902	0.330	0.000	0.000	0.000	36.502	63.167
140.0	4.150%	1.0	0.1070	515.7	572.3	1.1099	0.531	0.000	0.000	0.000	37.000	62.469
150.0	5.783%	1.0	0.1491	589.7	674.7	1.1442	1.367	0.000	0.000	0.000	37.274	61.359
160.0	8.007%	1.0	0.2064	645.6	759.0	1.1756	3.445	0.000	0.000	0.000	36.284	60.271
170.0	1.102%	1.1	0.2841	687.8	829.5	1.2060	8.203	0.000	0.000	0.000	30.549	61.248
180.0	1.468%	1.1	0.3785	720.3	890.4	1.2361	17.131	0.000	0.000	0.000	19.558	63.311
190.0	1.868%	1.1	0.4816	746.0	944.4	1.2659	28.861	0.000	0.000	0.000	10.838	60.302
200.0	2.279%	1.1	0.5874	766.6	993.4	1.2957	39.219	0.000	0.000	0.000	5.832	54.949
210.0	2.674%	1.1	0.6895	783.5	1090.8	1.3922	46.750	0.000	0.000	0.000	3.124	50.126
220.0	3.032%	1.1	0.7817	797.4	1196.1	1.45000	52.653	0.000	0.000	0.000	1.673	45.674
230.0	3.334%	1.1	0.8595	808.9	1304.4	1.6126	58.085	0.000	0.000	0.000	0.896	41.019
240.0	3.568%	1.1	0.9198	818.4	1408.2	1.7206	63.627	0.000	0.000	0.000	0.003	35.893
250.0	3.830%	1.1	0.9875	833.0	1561.5	1.8745	75.922	0.000	0.000	0.000	0.137	23.949
260.0	3.875%	1.1	0.9990	843.1	1588.1	1.8836	89.982	0.000	0.000	0.000	0.039	9.979
270.0	3.771%	1.1	0.9721	850.2	1488.9	1.7500	98.000	0.000	0.000	0.000	0.011	1.989
280.0	3.540%	1.1	0.9128	855.2	1333.3	1.5533	62.292	2.619	0.291	0.000	0.795	0.228
290.0	3.219%	1.1	0.8300	858.7	1191.2	1.3755	92.980	6.112	0.679	0.001	0.000	0.065
300.0	2.847%	1.1	0.7340	861.3	1092.7	1.2504	89.726	9.188	1.021	0.000	0.000	0.000
310.0	2.461%	1.1	0.6345	863.2	1036.9	1.1751	86.584	12.058	1.340	0.000	0.000	0.019
320.0	2.090%	1.1	0.5389	864.6	1012.4	1.1344	83.550	14.800	1.644	0.000	0.000	0.005
330.0	1.753%	1.1	0.4521	865.7	1005.0	1.0532	100.500	2.619	0.291	0.000	0.000	0.002
340.0	1.219%	1.1	0.3764	866.5	1009.5	1.096	80.622	17.439	1.938	0.000	0.000	0.000
350.0	1.460%	1.1	0.3124	867.1	1020.9	1.0926	77.794	19.985	2.221	0.000	0.000	0.000
360.0	1.212%	1.1	0.2595	867.6	1036.1	1.0648	75.062	22.444	2.494	0.000	0.000	0.000
370.0	1.007%	1.1	0.2164	868.0	1053.5	1.0532	72.422	24.820	2.758	0.000	0.000	0.000
380.0	8.396%	1.0	0.1817	868.3	1072.1	1.0276	6.1096	100.000	3.013	0.000	0.000	0.000
390.0	5.970%	1.0	0.1539	868.6	1091.3	1.0547	1.0350	64.997	3.261	0.000	0.000	0.000
400.0	5.106%	1.0	0.1316	868.8	1110.8	1.0803	1.0282	62.666	3.503	0.000	0.000	0.000
410.0	4.414%	1.0	0.1138	869.0	1130.6	1.1053	1.0229	60.394	3.733	0.000	0.000	0.000
420.0	3.859%	1.0	0.0995	869.1	1150.5	1.1294	1.0187	58.171	3.961	0.000	0.000	0.000
430.0	3.411%	1.0	0.0880	869.2	1170.4	1.1525	1.0155	55.986	4.183	0.000	0.000	0.000
440.0	3.049%	1.0	0.0786	869.6	1201.3	1.1748	1.0350	41.555	4.401	0.000	0.000	0.000
450.0	2.755%	1.0	0.0710	869.6	1207.3	1.2592	1.0132	53.828	4.617	0.000	0.000	0.000
460.0	2.016%	1.0	0.0520	869.6	1290.3	1.2796	1.0084	43.238	5.676	0.000	0.000	0.000
470.0	1.902%	1.0	0.0490	869.7	1310.3	1.2998	1.0080	41.191	5.881	0.000	0.000	0.000
480.0	2.514%	1.0	0.0648	869.5	1230.3	1.2177	1.0103	49.555	4.831	0.000	0.000	0.000
490.0	2.316%	1.0	0.0597	869.5	1250.3	1.2386	1.0095	47.432	5.045	0.000	0.000	0.000
500.0	2.152%	1.0	0.0555	869.6	1170.4	1.1525	1.0155	55.986	4.183	0.000	0.000	0.000
510.0	2.049%	1.0	0.0491	869.6	1270.3	1.2592	1.0088	45.323	4.401	0.000	0.000	0.000
520.0	2.016%	1.0	0.0460	869.6	1290.3	1.2796	1.0132	53.828	4.617	0.000	0.000	0.000
530.0	1.902%	1.0	0.0430	869.7	1310.3	1.2998	1.0084	43.238	5.676	0.000	0.000	0.000
540.0	1.807%	1.0	0.0466	869.7	1330.3	1.3200	1.0078	41.191	5.881	0.000	0.000	0.000
550.0	1.726%	1.0	0.0445	869.7	1350.3	1.3401	1.0076	39.196	5.724	0.000	0.000	0.000
560.0	1.691%	1.0	0.0425	869.7	1370.3	1.3601	1.0072	37.263	5.643	0.000	0.000	0.000

WE PUT UL= 3.0TH GET HST

INPUT: LAT = -12.0 LONGI = 283.1 R=100 MONTH = 3 HOUR = 8.0

CALCULATED VALUES: MLAT = -0.7 MLNG = 353.1
 DIP = 2.7 MODIP = 2.8 HAGLA = 1.4 XHI = 164.7
 SUNRISE = 6:0 L.T. SUNSET=16:0 L.T. SUN DEC = -3.3
 NMF2 = 8.84% NMF1 = 0.00% -01 NME=3.20%09 NMD=4.00%08
 HME2 = 305.4 HME1 = 0.0 HME=105.0 HMD = 88.0

RDHNU+		RDHDE+		RDHDF+		RDHDFE+	
TI	TE	TN	TE	TI	TE	TI	TE
H	NE	N/NMAX	NE	N/NMAX	NE	N/NMAX	NE
90.0	5.555%0.05	6.3%7	-1	-1	-1	-1	-1
85.0	2.480%0.08	2.8%4	-1	-1	-1	-1	-1
85.0	4.731%0.08	5.4%4	-1	-1	-1	-1	-1
90.0	4.731%0.08	5.10%9	0.0028	-1	-1	-1	-1
90.0	0.0036	0.0036	-1	-1	-1	-1	-1
70.0	3.201%0.09	0.0036	-1	-1	-1	-1	-1
70.0	2.704%0.09	0.0031	-1	-1	-1	-1	-1
110.0	2.704%0.09	0.0021	-1	-1	-1	-1	-1
115.0	1.835%0.09	0.0021	316.7	316.7	1.0000	0.000	18.284
120.0	1.173%0.09	0.0013	316.7	316.7	0.000	0.000	81.704
125.0	8.008%0.08	9.1%4	367.8	367.8	1.0031	0.000	21.005
130.0	6.387%0.08	7.2%4	419.7	419.7	0.019	0.000	78.976
135.0	6.265%0.08	7.1%4	464.7	464.7	0.031	0.000	75.900
140.0	7.633%0.08	8.6%4	507.8	507.8	0.050	0.000	72.552
140.0	0.2083	0.2083	507.8	507.8	0.000	0.000	69.189
150.0	1.809%0.09	0.020	585.9	579.1	0.000	0.000	66.305
160.0	4.246%1.00	0.0480	632.4	641.5	1.0054	0.210	33.564
170.0	8.053%1.00	0.0911	672.4	683.6	1.0073	0.339	35.472
180.0	1.253%1.11	0.1418	702.9	716.5	1.0089	0.545	36.502
190.0	1.841%1.11	0.2903	727.0	742.7	1.0117	1.402	30.549
200.0	2.566%1.11	0.3850	746.3	764.3	1.0143	3.534	61.037
210.0	3.403%1.11	0.4031	762.0	782.3	1.0168	8.414	61.187
220.0	4.313%1.11	0.4880	774.9	797.5	1.0192	17.572	63.159
230.0	5.243%1.11	0.5933	785.7	810.4	1.0217	29.604	62.455
240.0	6.138%1.11	0.6945	794.5	821.6	1.0242	40.230	59.558
250.0	7.621%1.11	0.8623	808.1	839.6	1.0266	47.955	62.870
260.0	8.512%1.11	0.9632	817.5	853.5	1.0291	54.012	63.502
270.0	9.733%1.11	0.9987	824.1	864.6	1.0316	59.586	62.455
280.0	10.727%1.11	0.9987	785.7	810.4	1.0340	65.274	59.558
290.0	11.727%1.11	0.9987	794.5	821.6	1.0340	65.274	59.558
300.0	12.727%1.11	0.9987	828.7	873.8	1.0340	65.274	59.558
310.0	13.727%1.11	0.9987	881.6	881.6	1.0359	73.584	53.930
320.0	14.727%1.11	0.9987	832.4	834.4	1.0312	77.893	53.930
330.0	15.727%1.11	0.9987	834.4	888.5	1.0262	92.268	53.930
340.0	16.727%1.11	0.9987	836.2	894.8	1.0222	98.000	53.930
350.0	17.727%1.11	0.9987	837.5	900.6	1.0218	45.679	53.930
360.0	18.727%1.11	0.9987	838.5	900.6	1.0218	45.679	53.930
370.0	19.727%1.11	0.9987	839.2	900.6	1.0218	45.679	53.930
380.0	20.727%1.11	0.9987	839.8	900.6	1.0218	45.679	53.930
390.0	21.727%1.11	0.9987	840.3	900.7	1.0218	45.679	53.930
400.0	22.727%1.11	0.9987	840.6	900.7	1.0218	45.679	53.930
410.0	23.727%1.11	0.9987	841.6	901.3	1.0218	45.679	53.930
420.0	24.727%1.11	0.9987	841.7	901.4	1.0218	45.679	53.930
430.0	25.727%1.11	0.9987	841.2	901.0	1.0218	45.679	53.930
440.0	26.727%1.11	0.9987	841.4	901.1	1.0218	45.679	53.930
450.0	27.727%1.11	0.9987	841.5	901.2	1.0218	45.679	53.930
460.0	28.727%1.11	0.9987	841.5	901.3	1.0218	45.679	53.930
470.0	29.727%1.11	0.9987	842.0	901.7	1.0218	45.679	53.930
480.0	30.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
490.0	31.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
500.0	32.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
510.0	33.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
520.0	34.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
530.0	35.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
540.0	36.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
550.0	37.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
560.0	38.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
570.0	39.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
580.0	40.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
590.0	41.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
600.0	42.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
610.0	43.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
620.0	44.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
630.0	45.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
640.0	46.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
650.0	47.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
660.0	48.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
670.0	49.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
680.0	50.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
690.0	51.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
700.0	52.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
710.0	53.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
720.0	54.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
730.0	55.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
740.0	56.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
750.0	57.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
760.0	58.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
770.0	59.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
780.0	60.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
790.0	61.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
800.0	62.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
810.0	63.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
820.0	64.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
830.0	65.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
840.0	66.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
850.0	67.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
860.0	68.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
870.0	69.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
880.0	70.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
890.0	71.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
900.0	72.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
910.0	73.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
920.0	74.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
930.0	75.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
940.0	76.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
950.0	77.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
960.0	78.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
970.0	79.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
980.0	80.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
990.0	81.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1000.0	82.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1010.0	83.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1020.0	84.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1030.0	85.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1040.0	86.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1050.0	87.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1060.0	88.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1070.0	89.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1080.0	90.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1090.0	91.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1100.0	92.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1110.0	93.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1120.0	94.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1130.0	95.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1140.0	96.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1150.0	97.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1160.0	98.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1170.0	99.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1180.0	100.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1190.0	101.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1200.0	102.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1210.0	103.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1220.0	104.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1230.0	105.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1240.0	106.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1250.0	107.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1260.0	108.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1270.0	109.727%1.11	0.9987	842.0	901.8	1.0218	45.679	53.930
1280.0	110.727%1.11						

INPUT: LATI= -12.0 LONGI= 283.1 R=100 MONTH= 6 HnUR=12.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MDIP= 2.8 MAGLA= 1.4 XHII= 35.1
 SUNRISE: 6.3 L.T. SUNSET: 17.7 L.T. SUN DEC.= 23.1
 NMF2=9.47% HMF1= 0.00% HME=1.69% NMD=1.25%
 HMF2=429.0 HMF1= 0.0 HME=110.0 HMD= 81.0

H	NE	N/HMAX	TN	TE	T ^I	TE/T ^I	RDD+	RDH+	RDHE+	RD02+	RDNO+
80.0	1.214%09	0.0013	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.422%09	0.0026	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.601%10	0.0275	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.922%10	0.0942	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.467%11	0.1550	-1	-1	-1	-1	0.318	0.000	0.000	0.000	29.728
105.0	1.670%11	0.1763	-1	-1	-1	-1	0.475	0.000	0.000	66.547	32.978
110.0	1.687%11	0.1782	-1	-1	-1	-1	0.709	0.000	0.000	63.296	35.994
115.0	1.720%11	0.1816	-1	-1	-1	-1	1.058	0.000	0.000	60.179	38.762
120.0	1.740%11	0.1837	337.2	337.2	-1	-1	1.579	0.000	0.000	57.158	41.264
125.0	1.761%11	0.1859	396.1	416.3	396.1	1.0000	2.352	0.000	0.000	54.168	43.479
130.0	1.782%11	0.1881	453.6	494.1	453.6	1.0511	3.500	0.000	0.000	51.145	45.354
135.0	1.803%11	0.1904	509.1	569.8	509.1	1.1193	5.195	0.000	0.000	48.078	46.728
140.0	1.825%11	0.1923	561.2	642.1	561.2	1.1443	7.675	0.000	0.000	45.000	47.325
150.0	1.871%11	0.1976	651.9	724.5	651.9	1.1863	16.307	0.000	0.000	38.577	45.115
160.0	1.919%11	0.2026	724.5	886.4	724.5	1.2235	31.954	0.000	0.000	30.030	38.016
170.0	1.969%11	0.2079	782.0	984.4	782.0	1.2588	53.273	0.000	0.000	19.622	27.100
180.0	2.022%11	0.2135	827.9	1070.8	827.9	1.2933	72.039	0.000	0.000	11.725	16.236
190.0	2.078%11	0.2195	865.1	1148.4	865.1	1.3275	82.836	0.000	0.000	6.883	10.281
200.0	2.138%11	0.2257	895.6	1219.4	895.6	1.3616	87.806	0.000	0.000	4.030	8.164
210.0	2.201%11	0.2324	920.8	1395.2	920.8	1.5153	90.162	0.000	0.000	2.358	7.480
220.0	2.269%11	0.2396	941.7	1589.3	941.7	1.6877	91.555	0.000	0.000	1.380	7.065
230.0	2.342%11	0.2474	959.2	1791.7	959.2	1.8680	92.623	0.000	0.000	0.808	6.569
240.0	2.422%11	0.2558	973.7	1986.8	973.7	2.0404	93.587	0.000	0.000	0.473	5.940
260.0	2.608%11	0.2754	996.0	2273.5	996.0	2.2826	95.453	0.000	0.000	0.162	4.385
280.0	2.851%11	0.3010	1011.6	2312.7	1011.6	2.4862	97.270	0.000	0.000	0.055	2.674
300.0	3.261%11	0.3444	1022.5	2104.8	1022.5	2.0585	98.000	0.347	0.039	0.019	1.595
320.0	4.652%11	0.4912	1030.2	1786.7	1028.8	1.7367	95.826	3.259	0.362	0.007	0.546
340.0	6.194%11	0.6541	1035.7	1496.9	1033.9	1.4478	92.521	6.560	0.729	0.002	0.187
360.0	7.561%11	0.9909	1047.6	1294.5	1038.2	1.2468	89.283	0.587	1.065	0.001	0.064
380.0	8.585%11	1.0311	1079.6	1177.6	1042.4	1.1297	86.157	12.439	1.382	0.000	0.022
400.0	9.201%11	0.9716	1044.7	1123.2	1048.4	1.0713	83.138	15.169	1.685	0.000	0.008
420.0	9.449%11	0.9978	1046.4	1108.5	1060.1	1.0456	80.225	17.796	1.977	0.000	0.003
440.0	9.384%11	0.9909	1047.6	1117.5	1081.5	1.0333	77.411	20.330	2.259	0.000	0.001
460.0	8.827%11	0.9321	1048.6	1140.1	1112.7	1.0247	74.692	22.777	2.531	0.000	0.000
480.0	7.886%11	0.9066	1042.6	1170.4	1150.1	1.0176	72.065	25.142	2.794	0.000	0.000
500.0	6.752%11	0.7129	1050.0	1204.9	1190.2	1.0123	69.523	27.429	3.048	0.000	0.000
520.0	5.595%11	0.5908	1050.5	1241.7	1231.0	1.0087	67.063	29.644	3.294	0.000	0.000
540.0	4.535%11	0.4786	1050.8	1279.9	1271.7	1.0064	64.676	31.792	3.532	0.000	0.000
560.0	3.631%11	0.3834	1051.2	1318.7	1312.3	1.0049	62.357	33.879	3.764	0.000	0.000
580.0	2.897%11	0.3059	1051.4	1358.0	1352.6	1.0040	60.096	35.914	3.990	0.000	0.000
600.0	2.321%11	0.2451	1051.6	1397.4	1392.7	1.0034	57.884	37.905	4.212	0.000	0.000
620.0	1.877%11	0.1982	1051.8	1437.0	1432.7	1.0030	55.710	39.861	4.429	0.000	0.000
640.0	1.539%11	0.1625	1052.0	1476.6	1472.7	1.0027	53.562	41.794	4.644	0.000	0.000
660.0	1.282%11	0.1353	1052.1	1516.3	1512.5	1.0025	51.431	43.712	4.857	0.000	0.000
680.0	1.086%11	0.1147	1052.2	1556.0	1552.3	1.0024	49.310	45.621	5.069	0.000	0.000
700.0	9.361%10	0.0988	1052.3	1595.7	1592.1	1.0023	47.198	47.522	5.280	0.000	0.000
720.0	8.209%10	0.0867	1052.4	1635.4	1631.9	1.0022	45.099	49.411	5.490	0.000	0.000
740.0	7.315%10	0.0772	1052.4	1675.1	1671.6	1.0021	43.025	51.278	5.698	0.000	0.000
760.0	6.645%10	0.0699	1052.5	1714.9	1711.3	1.0021	40.988	53.111	5.901	0.000	0.000
780.0	6.064%10	0.0640	1052.6	1754.6	1751.1	1.0020	39.002	54.898	6.100	0.000	0.000
800.0	5.627%10	0.0594	1052.6	1794.3	1790.8	1.0019	37.080	56.628	6.292	0.000	0.000
WE PUT B1=	3.0TU	GET HST									

INPUT: LATI= -12.0 LDMG1= 283.1 R=100 MONTH= 6 HNUR= 6.3

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1 XH= 90.0
 DTP= 2.7 MDDP= 2.8 MAGLA= 1.4 SUN DEC.= 23.1
 SUNRISE: 6.3 L.T. SUNSET: 17.7 L.T. NME= 3.59% 10 NMD= 4.00% 08
 NMF2= 3.21% 11 NMFL1= 0.00% -01 NME= 3.59% 10 NMD= 4.00% 08
 NMF2= 294.8 NMFL1= 0.0 HME= 107.5 HMD= 84.5

	H	NE	N/NMAX	TN	TE	T1	TE/T1	RDO+	RDHE+	RDH+	RDN0+	RDN0+
80.0	2.914% 08	9.1% -4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.081% 08	0.0013	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.842% 09	0.0057	-1	-1	-1	-1	-1	0.003	0.000	0.000	0.000	0.000
95.0	1.256% 10	0.0391	-1	-1	-1	-1	-1	0.006	0.000	0.000	0.000	0.000
100.0	2.890% 10	0.0899	-1	-1	-1	-1	-1	0.012	0.000	0.000	0.000	0.000
105.0	3.563% 10	0.1109	-1	-1	-1	-1	-1	0.023	0.000	0.000	0.000	0.000
110.0	3.457% 10	0.1076	-1	-1	-1	-1	-1	0.044	0.000	0.000	0.000	0.000
115.0	2.775% 10	0.0863	-1	320.1	320.1	1.0000	1.0376	0.084	0.000	0.000	36.294	68.422
120.0	2.191% 10	0.0682	320.1	386.4	372.4	1.0662	1.0662	0.161	0.000	0.000	40.716	79.595
125.0	2.164% 10	0.0673	372.4	451.4	423.4	1.0890	1.0890	0.308	0.000	0.000	43.939	76.313
130.0	2.745% 10	0.0854	423.4	514.1	472.0	1.1085	1.1085	0.586	0.000	0.000	45.000	72.535
135.0	3.532% 10	0.1099	472.0	516.6	516.6	1.1422	1.1422	2.079	0.000	0.000	41.880	63.621
140.0	4.037% 10	0.1256	516.6	675.0	591.0	1.1732	1.1732	6.925	0.000	0.000	36.631	59.122
150.0	5.184% 10	0.1613	675.0	759.3	647.2	1.2031	1.2031	19.707	0.000	0.000	30.703	49.590
160.0	6.671% 10	0.2076	759.3	829.8	689.7	1.2327	1.2327	41.982	0.000	0.000	21.641	36.377
170.0	8.625% 10	0.2684	829.8	890.5	722.4	1.2621	1.2621	63.935	0.000	0.000	10.559	25.506
180.0	1.113% 11	0.3464	722.4	944.4	748.3	1.2914	1.2914	77.146	0.000	0.000	4.137	18.718
190.0	1.391% 11	0.4329	944.4	993.2	769.1	1.3875	1.3875	83.481	0.000	0.000	1.545	14.973
200.0	1.682% 11	0.5236	993.2	1090.7	786.1	1.4947	1.4947	86.697	0.000	0.000	0.573	12.730
210.0	1.974% 11	0.6143	786.1	1195.9	800.1	1.6069	1.6069	88.765	0.000	0.000	0.212	11.022
220.0	2.253% 11	0.7011	800.1	1304.3	811.7	1.7144	1.7144	90.452	0.000	0.000	0.079	9.469
230.0	2.507% 11	0.7801	811.7	1408.0	821.3	1.8676	1.8676	93.576	0.000	0.000	0.011	6.413
240.0	2.726% 11	0.8483	821.3	1561.3	836.0	1.8766	1.8766	96.617	0.000	0.000	0.001	3.381
260.0	3.040% 11	0.9459	836.0	1588.0	846.2	1.8766	1.8766	98.000	0.000	0.000	0.000	2.000
280.0	3.188% 11	0.9920	846.2	1488.8	853.7	1.7440	1.7440	95.866	3.459	0.384	0.000	0.290
300.0	3.209% 11	0.9987	853.3	1333.2	860.8	1.5488	1.5488	92.561	6.659	0.740	0.000	0.040
320.0	3.120% 11	0.9708	858.4	1191.1	868.0	1.3723	1.3723	89.321	9.606	1.067	0.000	0.005
340.0	2.929% 11	0.8213	862.0	1092.6	875.5	1.2481	1.2481	86.193	12.425	1.381	0.000	0.001
360.0	2.665% 11	0.8292	864.6	1036.9	883.5	1.1736	1.1736	83.174	15.143	1.683	0.000	0.000
380.0	2.360% 11	0.7345	866.5	1012.4	893.2	1.1334	1.1334	80.259	17.143	2.790	0.000	0.000
400.0	2.046% 11	0.6367	867.9	1005.0	906.2	1.1090	1.1090	77.444	20.301	2.256	0.000	0.000
420.0	1.744% 11	0.5428	869.0	1009.5	924.2	1.0923	1.0923	74.724	22.748	2.528	0.000	0.000
440.0	1.470% 11	0.4576	869.8	1020.9	947.1	1.0779	1.0779	72.096	25.114	2.790	0.000	0.000
460.0	1.232% 11	0.3832	870.5	1036.1	973.1	1.0647	1.0647	70.028	35.891	3.988	0.000	0.000
480.0	1.029% 11	0.32203	871.0	10320.3	1000.3	1.0531	1.0531	69.553	27.402	3.045	0.000	0.000
500.0	8.619% 10	0.2682	871.3	1027.6	1027.6	1.0433	1.0433	67.091	29.618	3.291	0.000	0.000
520.0	7.251% 10	0.2256	871.7	1072.1	1072.1	1.0155	1.0155	64.704	31.767	3.530	0.000	0.000
540.0	5.145% 10	0.1912	871.9	1091.3	1054.4	1.0350	1.0350	53.585	41.773	4.641	0.000	0.000
560.0	5.253% 10	0.1635	872.1	1110.8	1080.3	1.0282	1.0282	62.383	33.855	3.762	0.000	0.000
580.0	4.537% 10	0.1412	872.3	1130.6	1105.3	1.0228	1.0228	60.122	35.891	3.988	0.000	0.000
600.0	3.961% 10	0.1233	871.3	1150.5	1129.4	1.0187	1.0187	57.909	37.882	4.209	0.000	0.000
620.0	3.497% 10	0.1088	872.4	1170.4	1152.5	1.0155	1.0155	55.734	39.840	4.427	0.000	0.000
640.0	3.121% 10	0.0971	872.7	1190.3	1174.8	1.0132	1.0132	53.585	41.773	4.641	0.000	0.000
660.0	2.815% 10	0.0876	872.7	1210.3	1196.5	1.0115	1.0115	51.453	43.692	4.855	0.000	0.000
680.0	2.566% 10	0.0794	872.8	1230.3	1217.7	1.0103	1.0103	49.332	45.602	5.067	0.000	0.000
700.0	2.361% 10	0.0735	872.9	1250.3	1238.6	1.0095	1.0095	47.218	45.119	5.278	0.000	0.000
720.0	2.192% 10	0.0682	872.9	1270.3	1259.2	1.0088	1.0088	45.393	49.393	5.488	0.000	0.000
740.0	2.052% 10	0.0638	873.0	1290.3	1279.6	1.0084	1.0084	43.043	51.261	5.696	0.000	0.000
760.0	1.935% 10	0.0602	873.0	1310.3	1299.8	1.0080	1.0080	41.005	53.095	5.899	0.000	0.000
780.0	1.837% 10	0.0572	873.0	1330.3	1320.0	1.0078	1.0078	39.019	54.883	6.098	0.000	0.000
800.0	1.755% 10	0.0546	873.1	1350.3	1340.1	1.0076	1.0076	37.096	56.614	6.290	0.000	0.000

WE PUT B1= 3.0TU GET HIST

INPUT: LAT1= -12.0 LONG1= 283.1 R=100 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1

DIP= 2.7 MODIP= 2.8 MAGLA= 1.4 XHI= 168.9
 SUNRISE: 6.3 L.T. SUNSET:17.7 L.T. SUN DEC.= 23.1
 NMF2=5.50%11 NMFL1= 0.00%01 NME=3.20%09 NMD=4.00%08
 HMFL2=303.1 HMF1= 0.0 HME=105.0 HMD= 88.0

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDO+	RDH+	RDHE+	RDO2+	RDNG+
80.0	5.309%05	9.7%-7	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.470%08	4.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.727%08	8.6%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.507%09	0.0046	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.193%09	0.0058	-1	-1	-1	-1	0.003	0.000	0.000	17.568	82.429
105.0	3.201%09	0.0058	-1	-1	-1	-1	0.006	0.000	0.000	20.399	79.594
110.0	2.703%09	0.0049	-1	-1	-1	-1	0.012	0.000	0.000	23.675	76.312
115.0	1.834%09	0.0033	-1	-1	-1	-1	0.024	0.000	0.000	27.442	72.535
120.0	1.171%09	0.0021	316.6	316.6	316.6	1.0000	0.045	0.000	0.000	31.698	68.256
125.0	7.990%08	0.0015	367.7	368.8	367.7	1.0031	0.086	0.000	0.000	36.294	63.619
130.0	6.367%08	0.0012	419.6	417.4	419.6	1.0054	0.165	0.000	0.000	40.716	59.118
135.0	6.240%08	0.0011	464.6	468.0	464.6	1.0073	0.316	0.000	0.000	43.939	55.745
140.0	7.599%08	0.0014	507.7	512.2	507.7	1.0089	0.601	0.000	0.000	45.000	54.399
150.0	1.801%09	0.0033	578.9	585.7	578.9	1.0117	2.132	0.000	0.000	41.880	55.987
160.0	7.990%08	0.0706	632.2	641.2	632.2	1.0143	7.103	0.000	0.000	36.631	56.267
170.0	6.550%10	0.1192	672.0	683.4	672.0	1.0169	20.214	0.000	0.000	30.703	49.083
180.0	9.745%10	0.1773	702.6	716.2	702.6	1.0194	43.062	0.000	0.000	21.641	35.296
190.0	1.377%11	0.2505	726.6	742.4	726.6	1.0218	65.582	0.000	0.000	10.559	23.859
200.0	1.853%11	0.3371	745.8	764.0	745.8	1.0243	79.133	0.000	0.000	4.137	16.730
210.0	2.385%11	0.4339	761.6	782.0	761.6	1.0268	85.634	0.000	0.000	1.545	12.821
220.0	2.945%11	0.5359	774.5	797.1	774.5	1.0293	88.935	0.000	0.000	0.573	10.492
230.0	3.503%11	0.6373	792.6	810.1	785.2	1.0318	91.059	0.000	0.000	0.212	8.729
240.0	4.025%11	0.7323	794.0	821.2	794.0	1.0343	92.792	0.000	0.000	0.079	7.129
250.0	4.863%11	0.8848	807.6	839.3	807.6	1.0393	96.005	0.000	0.000	0.011	3.984
260.0	5.342%11	0.9720	817.0	853.2	818.4	1.0425	99.071	0.000	0.000	0.001	0.927
300.0	5.494%11	0.9996	823.5	864.3	829.3	1.0423	98.000	1.384	0.154	0.000	0.462
320.0	5.412%11	0.9847	828.2	873.5	840.1	1.0398	85.862	12.667	1.407	0.000	0.063
340.0	5.116%11	0.9309	831.5	881.3	850.9	1.0358	73.253	24.065	2.674	0.000	0.009
360.0	4.659%11	0.8476	833.9	888.3	861.5	1.0311	62.465	33.780	3.753	0.000	0.001
380.0	4.106%11	0.7471	835.6	894.6	871.8	1.0261	53.283	42.045	4.672	0.000	0.000
400.0	3.524%11	0.6411	836.9	900.4	881.3	1.0216	45.473	49.074	5.453	0.000	0.000
420.0	2.962%11	0.5389	837.9	900.4	889.3	1.0125	38.835	55.048	6.116	0.000	0.000
440.0	2.453%11	0.4464	838.7	900.4	894.7	1.0063	33.200	60.120	6.680	0.000	0.000
460.0	2.014%11	0.3665	839.2	900.4	897.7	1.0030	28.424	64.418	7.158	0.000	0.000
480.0	1.648%11	0.2999	839.7	900.5	899.1	1.0015	24.384	68.054	7.562	0.000	0.000
500.0	1.350%11	0.2456	840.1	900.6	899.7	1.0009	20.976	71.121	7.902	0.000	0.000
520.0	1.111%11	0.2022	840.4	900.6	900.0	1.0006	18.109	73.702	8.189	0.000	0.000
540.0	9.216%10	0.1677	840.6	900.7	900.1	1.0006	15.702	75.868	8.430	0.000	0.000
560.0	7.720%10	0.1405	840.8	900.7	900.2	1.0006	13.685	77.684	8.632	0.000	0.000
580.0	6.541%10	0.1190	840.9	900.8	900.3	1.0006	11.992	79.207	8.801	0.000	0.000
600.0	5.610%10	0.1021	841.1	900.9	900.4	1.0006	10.567	80.489	8.943	0.000	0.000
620.0	4.873%10	0.0887	841.2	901.0	900.5	1.0005	9.359	81.577	9.064	0.000	0.000
640.0	4.286%10	0.0780	841.3	901.0	900.5	1.0005	8.326	82.507	9.167	0.000	0.000
660.0	3.816%10	0.0694	841.3	901.1	900.6	1.0005	7.433	83.310	9.257	0.000	0.000
680.0	3.437%10	0.0625	841.4	901.2	900.7	1.0005	6.654	84.011	9.335	0.000	0.000
700.0	3.130%10	0.0570	841.5	901.2	900.7	1.0005	5.969	84.628	9.403	0.000	0.000
720.0	2.880%10	0.0524	841.5	901.3	900.8	1.0005	5.362	85.174	9.464	0.000	0.000
740.0	2.675%10	0.0487	841.6	901.4	900.9	1.0005	4.822	85.660	9.518	0.000	0.000
760.0	2.506%10	0.0456	841.6	901.4	900.9	1.0005	4.339	86.095	9.566	0.000	0.000
780.0	2.365%10	0.0430	841.6	901.5	901.0	1.0005	3.906	86.484	9.609	0.000	0.000
800.0	2.248%10	0.0409	841.6	901.6	901.1	1.0005	3.518	86.834	9.648	0.000	0.000

WE PUT B1= 3 OTU GET HST

INPUT: LATI= -12.0 LONGI= 283.1 R=100 MMONTH=12 HJUR=12.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1

DIP= 2.7 NMDIP= 2.8 MAGLA= 1.4 XHI= 10.9
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC= -22.9
 NMFD=1.54% 12 NMFI= 3.55% 11 NAME=1.89% 11 NMD=1.34% 09
 NMFD=438.6 NMFI=347.9 HME=110.0 HMD= 81.0

			TE/TI	RDD+	RDHE+	RDD+	RDHE+	RD02+	RDND+
H	NE	N/IMAX	TN	-1	-1	-1	-1	-1	-1
80.0	1.299% 09	8.5% -4	-1	-1	-1	-1	-1	-1	-1
85.0	2.618% 09	0.0017	-1	-1	-1	-1	-1	-1	-1
90.0	2.828% 10	0.0184	-1	-1	-1	-1	-1	-1	-1
95.0	9.824% 10	0.0640	-1	-1	-1	-1	-1	-1	-1
100.0	1.635% 11	0.1065	-1	-1	-1	-1	-1	-1	-1
105.0	1.872% 11	0.1219	-1	-1	-1	-1	-1	-1	-1
110.0	1.893% 11	0.1233	-1	-1	-1	-1	-1	-1	-1
115.0	1.909% 11	0.1244	-1	-1	-1	-1	-1	-1	-1
120.0	1.916% 11	0.1248	339.1	339.1	1.0000	1.415	0.000	0.000	63.238
125.0	1.923% 11	0.1252	398.7	418.1	1.0487	2.024	0.000	0.000	55.356
130.0	1.930% 11	0.1257	456.8	495.7	1.0850	2.887	0.000	0.000	48.649
135.0	1.937% 11	0.1262	513.1	571.4	1.1135	4.107	0.000	0.000	55.869
140.0	1.945% 11	0.1266	566.0	643.6	1.1372	5.809	0.000	0.000	43.142
150.0	1.960% 11	0.1276	658.5	775.0	1.1769	11.251	0.000	0.000	38.887
160.0	1.975% 11	0.1286	733.1	888.4	1.2118	19.962	0.000	0.000	25.780
170.0	1.992% 11	0.1297	792.4	986.6	1.2450	30.669	0.000	0.000	33.479
180.0	2.009% 11	0.1308	840.0	1073.0	1.2773	40.806	0.000	0.000	63.238
190.0	2.027% 11	0.1320	878.7	1150.4	1.3093	49.733	0.000	0.000	59.698
200.0	2.045% 11	0.1332	910.4	1221.0	1.3411	58.351	0.000	0.000	62.197
210.0	2.065% 11	0.1345	936.7	1397.4	1.3918	67.504	0.000	0.000	55.552
220.0	2.086% 11	0.1359	958.6	1592.1	1.6608	77.593	0.000	0.000	63.633
230.0	2.108% 11	0.1373	976.9	1795.2	1.8377	88.070	0.000	0.000	64.268
240.0	2.132% 11	0.1388	992.1	1990.9	1.992.1	95.635	0.000	0.000	64.191
260.0	2.185% 11	0.1423	1015.4	2278.6	1.015.4	1015.4	0.000	0.000	55.552
280.0	2.247% 11	0.1464	1031.7	2317.8	1.031.7	2.2466	0.000	0.000	47.366
300.0	2.325% 11	0.1514	1043.1	2109.1	1.043.1	2.0219	0.000	0.000	40.473
320.0	2.435% 11	0.1586	1051.2	2179.0	1.050.7	1.7036	0.000	0.000	37.854
340.0	2.932% 11	0.1909	1057.0	1499.1	1.053.5	1.4229	0.000	0.000	36.536
360.0	5.601% 11	0.3648	1061.1	1295.9	1.055.4	1.2279	0.000	0.000	30.857
380.0	9.548% 11	0.6218	1064.2	1178.6	1.057.0	1.1150	0.000	0.000	21.908
400.0	1.298% 12	0.8450	1066.5	1124.0	1.060.6	1.0597	0.000	0.000	11.780
420.0	1.490% 12	0.9704	1068.2	1109.2	1.070.1	1.0366	0.000	0.000	4.320
440.0	1.535% 12	0.9998	1069.5	1118.3	1.089.8	1.0262	0.000	0.000	1.469
460.0	1.477% 12	0.9619	1070.5	1141.0	1.119.9	1.0188	0.000	0.000	0.000
480.0	1.335% 12	0.8696	1071.3	1171.3	1.116.6	1.0127	0.000	0.000	0.000
500.0	1.145% 12	0.7456	1072.0	1205.9	1.116.3	1.0081	0.000	0.000	0.000
520.0	9.416% 11	0.6132	1072.5	1242.9	1.1236.8	1.0050	0.000	0.000	0.000
540.0	7.519% 11	0.4897	1072.9	1281.2	1.1277.4	1.0029	0.000	0.000	0.000
560.0	5.899% 11	0.3842	1073.2	1320.2	1.1317.9	1.0017	0.000	0.000	0.000
580.0	4.596% 11	0.2993	1073.5	1359.6	1.1358.3	1.0010	0.000	0.000	0.000
600.0	3.589% 11	0.2337	1073.7	1399.5	1.1398.5	1.0005	0.000	0.000	0.000
620.0	2.828% 11	0.1842	1073.9	1438.6	1.1438.6	1.0002	0.000	0.000	0.000
640.0	2.260% 11	0.1472	1074.1	1478.7	1.1478.6	1.0000	0.000	0.000	0.000
660.0	1.838% 11	0.1197	1074.2	1518.5	1.1518.6	0.9999	0.000	0.000	0.000
680.0	1.524% 11	0.0992	1074.3	1558.3	1.1558.5	0.9999	0.000	0.000	0.000
700.0	1.288% 11	0.0839	1074.4	1598.4	1.1598.4	0.9999	0.000	0.000	0.000
720.0	1.111% 11	0.0723	1074.5	1638.3	1.1638.3	0.9998	0.000	0.000	0.000
740.0	9.753% 10	0.0635	1074.6	1677.9	1.1678.2	0.9998	0.000	0.000	0.000
760.0	8.710% 10	0.0567	1074.6	1717.7	1.1718.0	0.9998	0.000	0.000	0.000
780.0	7.900% 10	0.0514	1074.7	1757.6	1.1757.9	0.9998	0.000	0.000	0.000
800.0	7.265% 10	0.0473	1074.7	1797.4	1.1797.8	0.9998	0.000	0.000	0.000
WE PUT b1= 3.0TU GET HST									0.000

INPUT: LATI= -12.0 LONGI= 283.1 R=100 MONTH=12 HOUR= 5.7

CALCULATED VALUES: MLAT= -0.7 MLONG= 353.1
 DTP= 2.7 MODIP= 2.8 MAGLA= 1.4 XHI= 90.0
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC. = -22.9
 NMF2=4.60%11 NMFI= 0.00%-01 NME=3.57%10 NMD=4.00%08
 HMF2=282.3 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDD+	RDH+	RDHE+	RDN0+	RDN2+
80.0	2.914%08	6.3%4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.081%08	8.9%4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.842%09	0.0040	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.254%10	0.0273	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.880%10	0.0627	-1	-1	-1	-1	0.016	0.000	0.000	6.623	93.361
105.0	3.546%10	0.0772	-1	-1	-1	-1	0.025	0.000	0.000	8.541	91.434
110.0	3.442%10	0.0749	-1	-1	-1	-1	0.040	0.000	0.000	10.994	88.966
115.0	2.773%10	0.0604	-1	-1	-1	-1	0.064	0.000	0.000	14.085	85.852
120.0	2.200%10	0.0479	320.8	320.8	1	1	0.101	0.000	0.000	17.829	82.070
125.0	2.174%10	0.0473	373.4	373.4	1	1	0.0373	0.000	0.000	21.966	77.875
130.0	2.744%10	0.0597	424.7	452.5	424.7	1	0.0657	0.252	0.000	25.782	73.966
135.0	3.517%10	0.0765	473.6	515.4	473.6	1	0.0883	0.397	0.000	28.494	71.110
140.0	4.056%10	0.0883	518.4	574.2	518.4	1	0.1076	0.623	0.000	30.000	69.377
150.0	5.194%10	0.1130	593.5	677.1	593.5	1	0.1409	1.498	0.000	31.126	67.376
160.0	6.735%10	0.1466	650.3	761.8	650.3	1	0.1715	3.368	0.000	31.531	65.101
170.0	8.911%10	0.1939	693.3	832.7	693.3	1	0.2011	6.679	0.000	31.688	61.633
180.0	1.227%11	0.2669	726.5	893.8	726.5	1	0.2303	11.436	0.000	30.852	57.711
190.0	1.673%11	0.3641	752.8	947.9	752.8	1	0.2593	17.669	0.000	25.763	56.569
200.0	2.168%11	0.4717	773.9	997.0	773.9	1	0.2882	26.008	0.000	16.079	57.913
210.0	2.679%11	0.5829	791.2	1094.5	791.2	1	0.3833	37.565	0.000	8.607	53.827
220.0	3.172%11	0.6903	805.4	1199.7	805.4	1	0.4895	53.681	0.000	4.466	41.853
230.0	3.615%11	0.7868	1308.0	1308.0	817.2	1	0.606	74.390	0.000	2.307	23.303
240.0	3.984%11	0.8670	827.0	1411.7	827.0	1	0.7069	92.014	0.000	1.191	6.796
260.0	4.452%11	0.9688	842.0	1564.7	842.0	1	0.8584	99.365	0.000	0.317	0.318
280.0	4.594%11	0.9997	852.3	1591.0	852.3	1	0.8666	99.536	0.014	0.002	0.084
300.0	4.524%11	0.9844	859.6	1491.3	859.6	1	0.7349	99.314	0.510	0.023	0.097
320.0	4.286%11	0.9328	864.7	1335.3	865.8	1	0.5422	97.052	2.625	0.292	0.006
340.0	3.922%11	0.8534	868.4	1192.7	872.1	1	0.3676	93.704	5.659	0.629	0.007
360.0	3.480%11	0.7574	871.0	1093.7	878.7	1	0.2447	90.424	8.616	0.957	0.002
380.0	3.011%11	0.6552	873.0	1037.4	885.9	1	0.1711	87.258	11.468	1.274	0.000
400.0	2.553%11	0.5556	874.4	1012.4	894.7	1	0.0647	84.201	14.219	1.580	0.000
420.0	2.134%11	0.4644	875.5	1005.0	907.0	1	0.1080	81.250	16.875	1.875	0.000
440.0	1.767%11	0.3846	876.4	1009.5	924.6	1	0.0919	78.400	19.440	2.160	0.000
460.0	1.458%11	0.3172	877.0	1020.9	947.3	1	0.0777	75.647	21.918	2.435	0.000
480.0	1.202%11	0.2165	877.5	1036.1	973.2	1	0.0647	72.986	24.313	2.701	0.000
500.0	9.949%10	0.2164	877.9	1053.5	1000.3	1	0.0532	70.412	26.629	2.959	0.000
520.0	8.288%10	0.1804	878.2	1072.1	1027.6	1	0.0433	67.920	28.208	0.000	0.000
540.0	6.964%10	0.1515	878.5	1091.3	1054.3	1	0.0350	65.503	31.048	3.450	0.000
560.0	5.911%10	0.1286	878.7	1110.8	1080.3	1	0.0283	63.154	33.162	3.685	0.000
580.0	5.074%10	0.1104	878.9	1130.6	1105.3	1	0.0229	60.864	35.223	3.914	0.000
600.0	4.407%10	0.0959	879.0	1150.5	1129.3	1	0.0187	58.624	37.239	4.138	0.000
620.0	3.872%10	0.0843	879.1	1170.4	1152.5	1	0.0155	56.422	39.221	4.358	0.000
640.0	3.442%10	0.0749	879.2	1190.3	1174.8	1	0.0132	54.247	41.178	4.575	0.000
660.0	3.094%10	0.0673	879.3	1210.3	1196.5	1	0.0115	52.089	43.120	4.791	0.000
680.0	2.811%10	0.0612	879.4	1230.3	1217.6	1	0.0103	49.941	45.054	5.006	0.000
700.0	2.579%10	0.0561	879.5	1250.3	1238.6	1	0.0095	47.801	46.979	5.220	0.000
720.0	2.389%10	0.0520	879.5	1270.3	1259.1	1	0.0089	45.676	48.892	5.432	0.000
740.0	2.231%10	0.0485	879.6	1290.3	1279.5	1	0.0084	43.575	50.783	5.643	0.000
760.0	2.100%10	0.0457	879.6	1310.3	1299.8	1	0.0081	41.512	52.639	5.849	0.000
780.0	1.990%10	0.0433	879.6	1330.0	1320.0	1	0.0078	39.501	46.050	6.050	0.000
800.0	1.898%10	0.0413	879.7	1350.3	1340.1	1	0.0076	37.553	56.202	6.245	0.000

WE PUT Bl= 3.0TU GET HST

INPUT: LATI= -12.0 LONG1= 283.1 R=100 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= -0.7 MLNG= 353.1
 DIP= 2.7 MNDDIP= 2.8 MAGLA= 1.4 XHI= 145.1
 SUNRISE= 5.7 L.T. SUNSET= 18.3 L.T. SUN DEC.= -22.9
 NMF1= 5.10%11 NMF1= 0.00%01 NME= 3.20%09 NMD= 4.00%08
 HMF2= 342.5 HMF1= 0.0 HME= 105.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDHE+	RDH+	RDO+	RDO2+	RDND+
80.0	5.826%05	1.1%-6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.490%08	4.9%-4	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.736%08	9.3%-4	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.512%09	0.0049	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.193%09	0.0063	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.201%09	0.0063	-1	-1	-1	-1	-1	-1	-1	-1
110.0	2.705%09	0.0053	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.837%09	0.0036	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.175%09	0.0023	-1	-1	-1	-1	-1	-1	-1	-1
125.0	6.027%08	0.0016	370.2	371.0	370.2	1.0000	0.000	0.000	0.000	0.000
130.0	6.407%08	0.0013	420.5	422.2	420.5	1.0041	0.025	0.000	0.000	0.000
135.0	6.290%08	0.0012	468.5	471.1	468.5	1.0055	0.040	0.000	0.000	0.000
140.0	7.669%08	0.0015	512.3	515.8	512.3	1.0067	0.064	0.000	0.000	0.000
145.0	1.817%09	0.0036	585.2	590.3	585.2	1.0088	0.104	0.000	0.000	0.000
150.0	4.523%09	0.0089	640.0	646.8	640.0	1.0107	0.160	0.000	0.000	0.000
155.0	4.562%09	0.013	681.2	689.8	681.2	1.0125	0.253	0.000	0.000	0.000
160.0	1.062%10	0.0208	723.1	723.1	712.9	1.0144	0.398	0.000	0.000	0.000
165.0	2.088%10	0.0410	712.9	749.8	737.9	1.0162	0.624	0.000	0.000	0.000
170.0	3.612%10	0.0709	737.9	771.6	757.9	1.0180	1.502	0.000	0.000	0.000
175.0	5.667%10	0.1112	757.9	789.7	774.3	1.0198	3.378	0.000	0.000	0.000
180.0	8.331%10	0.1635	774.3	804.8	787.8	1.0217	6.698	0.000	0.000	0.000
185.0	1.168%11	0.2293	804.8	817.7	798.9	1.0235	11.468	0.000	0.000	0.000
190.0	1.568%11	0.3077	798.9	828.7	808.2	1.0254	17.718	0.000	0.000	0.000
195.0	2.020%11	0.3963	808.2	846.2	822.3	1.0291	26.081	0.000	0.000	0.000
200.0	2.998%11	0.5883	822.3	859.4	832.2	1.0327	37.671	0.000	0.000	0.000
205.0	3.913%11	0.7678	832.1	869.7	841.2	1.0339	53.832	0.000	0.000	0.000
210.0	4.597%11	0.9019	839.0	878.0	850.2	1.0327	74.597	0.000	0.000	0.000
215.0	4.978%11	0.9768	843.8	884.8	859.1	1.0300	92.232	0.000	0.000	0.000
220.0	5.095%11	0.9998	847.3	884.8	867.9	1.0291	97.671	0.000	0.000	0.000
225.0	5.009%11	0.9829	849.8	890.8	866.4	1.0223	87.497	0.000	0.000	0.000
230.0	4.719%11	0.926	851.6	896.0	876.4	1.0223	21.463	0.000	0.000	0.000
235.0	4.279%11	0.8396	853.0	900.8	884.3	1.0186	37.907	0.000	0.000	0.000
240.0	3.755%11	0.7367	854.0	900.7	890.9	1.0110	66.140	0.000	0.000	0.000
245.0	3.209%11	0.6297	854.8	900.8	895.5	1.0059	57.575	0.000	0.000	0.000
250.0	2.690%11	0.5278	855.4	900.8	898.0	1.0032	50.075	0.000	0.000	0.000
255.0	2.226%11	0.4367	855.9	901.0	899.2	1.0019	43.562	0.000	0.000	0.000
260.0	1.829%11	0.3589	856.3	901.1	899.8	1.0014	37.907	0.000	0.000	0.000
265.0	1.502%11	0.2946	856.6	901.2	900.1	1.0012	60.298	0.000	0.000	0.000
270.0	1.237%11	0.2427	856.8	901.3	900.3	1.0011	28.750	0.000	0.000	0.000
275.0	1.026%11	0.2013	857.0	901.5	900.5	1.0011	25.069	0.000	0.000	0.000
280.0	8.591%10	0.1686	857.2	901.6	900.6	1.0011	11.519	0.000	0.000	0.000
285.0	6.262%10	0.0836	857.3	901.8	900.8	1.0014	19.145	0.000	0.000	0.000
290.0	4.848%10	0.0755	857.4	901.9	900.9	1.0012	16.783	0.000	0.000	0.000
295.0	3.243%10	0.1225	857.5	902.0	901.0	1.0011	14.755	0.000	0.000	0.000
300.0	1.237%10	0.1065	857.6	902.2	901.2	1.0011	13.014	0.000	0.000	0.000
305.0	1.026%10	0.0938	857.7	902.3	901.3	1.0011	11.519	0.000	0.000	0.000
310.0	8.779%10	0.0836	857.7	902.4	901.5	1.0011	10.232	0.000	0.000	0.000
315.0	6.262%10	0.0557	857.7	902.4	901.5	1.0011	9.119	0.000	0.000	0.000
320.0	4.848%10	0.0528	857.7	902.5	901.6	1.0011	8.171	0.000	0.000	0.000
325.0	3.243%10	0.0689	857.8	902.6	901.7	1.0011	8.150	0.000	0.000	0.000
330.0	1.237%10	0.0636	857.8	902.7	901.7	1.0011	7.301	0.000	0.000	0.000
335.0	1.026%10	0.0593	857.9	902.9	901.9	1.0011	6.551	0.000	0.000	0.000
340.0	8.779%10	0.0557	857.9	903.0	902.0	1.0011	5.886	0.000	0.000	0.000
345.0	6.262%10	0.0528	857.9	903.1	902.2	1.0011	5.294	0.000	0.000	0.000
350.0	4.848%10	0.0528	857.9	903.1	902.2	1.0011	4.764	0.000	0.000	0.000
355.0	3.242%10	0.0636	857.8	902.9	901.9	1.0011	4.290	0.000	0.000	0.000
360.0	1.242%10	0.0593	857.9	903.0	902.0	1.0011	3.863	0.000	0.000	0.000
365.0	1.021%10	0.0557	857.9	903.1	902.2	1.0011	3.480	0.000	0.000	0.000

WE PUT Bl= 3.0TU GET HST

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH= 3 HOUR=12.0

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MDIP= -46.8 MAGLA= -29.1 XHI= 48.4
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T.
 NMF1= 5.30% NMF11= 2.18% NMF1= 1.10% NMF11= 1.10% NMF1= 5.13% NMF11= 81.0 HMD= 81.0

H	NE	N/NMAX	TN	TE	TE/TI	TI	RD0+	RD0+	RDHE+	RDH+	RDHE+	RDH+	RD0+	RD0+	
80.0	4.887%08	9.2%-4	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
85.0	1.020%09	0.0019	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
90.0	1.062%10	0.0200	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
95.0	4.292%10	0.0810	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
100.0	8.482%10	0.1600	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
105.0	1.070%11	0.2019	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
110.0	1.102%11	0.2079	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
115.0	1.069%11	0.2017	-1	-1	-1	-1	"1	"1	"1	"1	"1	"1	"1	"1	
120.0	1.054%11	0.1988	305.0	305.0	1.0000	1.0000	0.000	0.000	0.000	0.000	0.000	0.000	48.854	49.339	
125.0	1.099%11	0.2074	351.6	351.6	1.0737	1.979	0.000	0.000	0.000	0.000	0.000	0.000	52.125	47.668	
130.0	1.131%11	0.2133	396.8	448.7	396.8	1.1307	3.076	0.000	0.000	0.000	0.000	0.000	0.000	51.477	48.196
135.0	1.156%11	0.2180	439.4	517.2	439.4	1.1770	4.736	0.000	0.000	0.000	0.000	0.000	0.000	50.759	48.728
140.0	1.184%11	0.2234	477.5	581.2	477.5	1.2171	7.175	0.000	0.000	0.000	0.000	0.000	0.000	49.854	48.531
150.0	1.255%11	0.2368	538.7	694.2	538.7	1.2887	15.113	0.000	0.000	0.000	0.000	0.000	0.000	50.203	49.854
160.0	1.358%11	0.2562	582.7	790.1	582.7	1.3559	26.363	0.000	0.000	0.000	0.000	0.000	0.000	51.523	49.854
170.0	1.542%11	0.2908	614.7	873.9	614.7	1.4217	36.882	0.000	0.000	0.000	0.000	0.000	0.000	43.677	53.247
180.0	1.979%11	0.3733	638.7	949.8	639.0	1.4865	44.217	0.000	0.000	0.000	0.000	0.000	0.000	40.379	54.885
190.0	2.395%11	0.4518	657.4	1020.3	661.6	1.5422	49.297	0.000	0.000	0.000	0.000	0.000	0.000	37.000	55.825
200.0	3.186%11	0.6009	672.2	1087.0	684.2	1.5887	53.471	0.000	0.000	0.000	0.000	0.000	0.000	30.770	54.117
210.0	3.928%11	0.7409	684.3	1150.9	706.8	1.6282	57.448	0.000	0.000	0.000	0.000	0.000	0.000	25.484	48.152
220.0	4.539%11	0.8561	694.1	1212.6	729.5	1.6623	61.526	0.000	0.000	0.000	0.000	0.000	0.000	20.934	42.184
230.0	4.969%11	0.9373	702.2	1272.6	752.1	1.6920	65.823	0.000	0.000	0.000	0.000	0.000	0.000	16.474	39.309
240.0	5.212%11	0.9831	709.0	1331.1	774.7	1.7182	70.397	0.000	0.000	0.000	0.000	0.000	0.000	11.697	39.006
260.0	5.286%11	0.9970	719.2	1445.1	820.0	1.7623	80.490	0.000	0.000	0.000	0.000	0.000	0.000	7.746	38.784
280.0	5.097%11	0.9610	726.3	1555.9	865.2	1.7982	91.650	0.000	0.000	0.000	0.000	0.000	0.000	5.046	37.505
300.0	4.730%11	0.8922	731.3	1664.5	910.5	1.8282	98.000	0.000	0.000	0.000	0.000	0.000	0.000	3.280	35.194
320.0	4.245%11	0.8007	734.8	1771.7	955.8	1.8597	98.409	0.000	0.000	0.000	0.000	0.000	0.000	2.131	32.046
340.0	3.704%11	0.6986	737.3	1877.9	1001.1	1.8758	98.416	0.000	0.000	0.000	0.000	0.000	0.000	1.384	26.219
360.0	3.161%11	0.5962	739.1	1949.2	1046.6	1.8624	98.414	0.000	0.000	0.000	0.000	0.000	0.000	0.984	18.925
380.0	2.654%11	0.5006	740.4	1987.3	1092.6	1.8189	98.411	0.000	0.000	0.000	0.000	0.000	0.000	0.247	8.104
400.0	2.205%11	0.4159	741.4	2026.2	1139.6	1.7780	98.408	0.000	0.000	0.000	0.000	0.000	0.000	0.104	1.896
420.0	1.822%11	0.3437	742.1	2065.5	1168.9	1.8597	98.409	0.000	0.000	0.000	0.000	0.000	0.000	0.044	1.547
440.0	1.505%11	0.2839	742.7	2105.0	1241.4	1.6957	98.416	0.200	0.022	0.019	0.019	0.019	0.019	0.043	1.344
460.0	1.247%11	0.2353	743.1	2144.7	1297.2	1.6533	97.221	2.494	0.910	0.101	0.101	0.101	0.101	0.567	0.567
480.0	1.040%11	0.1962	743.5	2184.4	1355.2	1.6119	95.705	3.863	0.429	0.429	0.429	0.429	0.429	0.003	0.239
500.0	8.753%10	0.1651	743.8	2224.2	1414.2	1.5727	94.186	5.232	0.581	0.000	0.000	0.000	0.000	0.001	0.101
520.0	7.442%10	0.1404	744.0	2264.1	1473.7	1.5363	92.678	6.589	0.732	0.000	0.000	0.000	0.000	0.001	0.043
540.0	6.400%10	0.1207	744.2	2303.9	1533.4	1.5025	91.176	7.941	0.882	0.000	0.000	0.000	0.000	0.001	0.018
560.0	5.571%10	0.1051	744.3	2343.7	1593.2	1.4711	89.673	9.295	1.023	0.000	0.000	0.000	0.000	0.000	0.008
580.0	4.908%10	0.0926	744.4	2383.6	1652.9	1.4420	88.158	10.658	1.184	0.000	0.000	0.000	0.000	0.000	0.008
600.0	4.376%10	0.0825	744.5	2423.4	1712.7	1.4150	86.619	12.643	1.338	0.000	0.000	0.000	0.000	0.000	0.008
620.0	3.946%10	0.0744	744.6	2463.3	1772.5	1.3897	85.039	13.655	1.496	0.000	0.000	0.000	0.000	0.000	0.008
640.0	3.597%10	0.0678	744.7	2503.1	1832.2	1.3662	83.403	14.937	1.660	0.000	0.000	0.000	0.000	0.000	0.008
660.0	3.312%10	0.0625	744.7	2543.0	1892.0	1.3441	81.692	16.477	1.831	0.000	0.000	0.000	0.000	0.000	0.008
680.0	3.078%10	0.0581	744.8	2582.8	1951.8	1.3233	79.895	18.095	2.011	0.000	0.000	0.000	0.000	0.000	0.008
700.0	2.885%10	0.0544	744.8	2622.7	2011.6	1.3038	78.005	19.222	2.199	0.000	0.000	0.000	0.000	0.000	0.008
720.0	2.725%10	0.0514	744.9	2662.5	2071.3	1.2854	76.031	21.572	2.397	0.000	0.000	0.000	0.000	0.000	0.008
740.0	2.591%10	0.0489	744.9	2702.4	2131.1	1.2681	73.986	23.412	2.601	0.000	0.000	0.000	0.000	0.000	0.008
760.0	2.479%10	0.0468	744.9	2742.2	2190.9	1.2516	71.895	25.295	2.811	0.000	0.000	0.000	0.000	0.000	0.008
780.0	2.386%10	0.0450	744.9	2782.1	2250.7	1.2361	69.781	27.197	3.022	0.000	0.000	0.000	0.000	0.000	0.008
800.0	2.306%10	0.0435	745.0	2821.9	2310.4	1.2214	67.669	29.098	3.233	0.000	0.000	0.000	0.000	0.000	0.008

WE PUT 81= 3.0TU GET HST

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH= 3 HOUR= 5.7

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MNDIP= -46.8 MAGLA= -29.1 XHI= 90.0
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC. = -3.3
 NMF2=1.58%11 NMFL1= 0.00%-01 NME=3.02%10 NMD=4.00%08
 HMF2=269.0 HMFL1= 0.0 HME=107.5 HMD= 84.5

H	NE	TN	TE	TI	TE/TI	RDD+	RDH+	RDHE+	RDO2+	RDNO+
80.0	2.826%08	0.0018	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.100%08	0.0026	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.813%09	0.0115	-1	-1	-1	-1	-1	-1	-1	-1
95.0	0.1.144%10	0.0723	-1	-1	-1	0.020	0.000	0.000	0.000	82.030
100.0	2.491%10	0.1574	-1	-1	-1	0.020	0.031	0.000	0.000	79.081
105.0	3.006%10	0.1899	-1	-1	-1	0.020	0.048	0.000	0.000	75.721
110.0	2.925%10	0.1848	-1	-1	-1	0.020	0.074	0.000	0.000	72.039
115.0	2.423%10	0.1531	-1	-1	-1	0.020	0.114	0.000	0.000	68.361
120.0	1.947%10	0.1230	291.5	291.5	1.0000	0.177	0.000	0.000	0.000	65.313
125.0	1.740%10	0.1100	333.0	351.0	1.0540	0.275	0.000	0.000	0.000	63.424
130.0	1.819%10	0.1149	373.2	409.2	1.0964	0.425	0.000	0.000	0.000	62.996
135.0	2.078%10	0.1313	410.5	464.4	1.1315	0.655	0.000	0.000	0.000	62.345
140.0	2.396%10	0.1514	443.1	515.1	1.1624	1.525	0.000	0.000	0.000	62.140
145.0	3.142%10	0.1986	493.6	601.6	1.2187	3.347	0.000	0.000	0.000	61.250
150.0	3.439%10	0.2173	528.4	672.3	1.2725	6.466	0.000	0.000	0.000	59.514
155.0	3.793%10	0.2397	552.9	732.9	1.3254	10.415	0.000	0.000	0.000	59.151
160.0	4.233%10	0.2675	571.1	787.0	1.3717	14.360	0.000	0.000	0.000	62.710
165.0	4.828%10	0.3050	584.9	836.9	1.4075	18.208	0.000	0.000	0.000	66.412
170.0	5.916%10	0.3738	595.9	883.8	1.4362	22.316	0.000	0.000	0.000	67.645
175.0	8.198%10	0.5180	604.7	928.6	1.4597	27.023	0.000	0.000	0.000	66.451
180.0	1.050%11	0.6632	611.9	971.8	1.4792	32.590	0.000	0.000	0.000	66.170
185.0	1.254%11	0.7925	617.9	1013.8	1.4956	39.250	0.000	0.000	0.000	57.995
190.0	1.410%11	0.8911	622.8	1054.6	1.5096	56.860	0.000	0.000	0.000	41.977
195.0	1.413%11	0.8931	622.8	1134.0	1.5320	81.425	0.000	0.000	0.000	18.085
200.0	1.570%11	0.9922	630.2	1211.2	1.5541	98.000	0.000	0.000	0.000	0.207
205.0	1.574%11	0.9943	635.4	1286.7	1.5626	99.136	0.000	0.000	0.000	1.793
210.0	1.514%11	0.9569	638.9	1361.3	1.5736	99.157	0.000	0.000	0.000	0.777
215.0	1.276%11	0.8911	641.5	1435.1	1.5829	99.157	0.000	0.000	0.000	0.037
220.0	1.128%11	0.8064	643.3	1489.5	1.5711	99.156	0.418	0.046	0.016	0.364
225.0	0.979%10	0.6188	644.6	1525.3	1.5422	99.153	0.618	0.069	0.007	0.154
230.0	0.893%10	0.5303	646.3	1561.5	1.5626	99.149	0.705	0.078	0.003	0.065
235.0	0.713%10	0.4509	646.8	1581.2	1.5736	99.141	0.748	0.083	0.001	0.027
240.0	0.715%10	0.4509	647.2	1607.7	1.4809	99.141	0.875	0.097	0.000	0.012
245.0	0.604%10	0.3821	647.5	1621.0	1.4508	99.016	0.875	0.097	0.000	0.005
250.0	0.3240	0.3240	647.6	1640.9	1.4260	97.954	1.837	0.204	0.000	0.000
255.0	0.2758	0.2758	647.8	1640.9	1.4047	96.426	3.215	0.357	0.000	0.002
260.0	0.2364%10	0.2364%10	648.0	1660.9	1.3856	94.896	4.593	0.510	0.000	0.001
265.0	0.2399%10	0.2399%10	648.2	1680.9	1.3678	93.376	5.961	0.662	0.000	0.000
270.0	0.2300%10	0.2041	648.5	1680.9	1.3678	91.863	7.323	0.814	0.000	0.000
275.0	0.1277%10	0.1277%10	648.6	1700.9	1.3510	90.348	8.686	0.965	0.000	0.000
280.0	0.1227%10	0.1227%10	648.7	1720.9	1.3350	88.822	10.060	1.118	0.000	0.000
285.0	0.1397	0.1397	648.5	1740.9	1.3198	87.271	11.456	1.273	0.000	0.000
290.0	0.1258	0.1258	648.5	1760.9	1.3053	85.376	12.888	1.432	0.000	0.000
295.0	0.1144	0.1144	648.6	1780.9	1.2914	84.031	14.372	1.597	0.000	0.000
300.0	0.1050	0.1050	648.7	1800.9	1.2781	82.308	15.923	1.769	0.000	0.000
305.0	0.0973	0.0973	648.7	1820.9	1.2653	80.497	17.553	1.950	0.000	0.000
310.0	0.0910	0.0910	648.7	1840.9	1.2531	78.593	19.266	2.141	0.000	0.000
315.0	0.0857	0.0857	648.8	1860.9	1.2414	76.604	21.057	2.340	0.000	0.000
320.0	0.0813	0.0813	648.8	1880.9	1.2301	74.546	22.911	2.546	0.000	0.000
325.0	0.0776	0.0776	648.8	1900.9	1.2192	72.437	24.807	2.756	0.000	0.000
330.0	0.0745	0.0745	648.8	1920.9	1.1988	70.307	26.723	2.969	0.000	0.000
335.0	0.0719	0.0719	648.9	1940.9	1.1988	68.179	28.639	3.182	0.000	0.000
340.0	0.104%10	0.0697	648.9	1960.9	1.1891	WE PUF B1= 3.0TU GET HST	0.000	0.000	0.000	0.000

INPUT: LATI = -51.7 LONGI = 302.2 R = 10 MUNTH= 3 HURR= 0.0

CALCULATED VALUES: NLAT = -40.5 NL-NG = 9.3
 DIP = -48.0 MIDIP = -46.8 MAGLA = -29.1 XHI = 125.0
 SUNRSE : 5.7 L-T : SUNSET:18.3 L-T : SUN DEC. = -3.
 NMF2=1.56% HMF1 = 0.00%-01 NMFD=1.78% NMDF=4.00%OB
 NMF2=3.57% HMF1 = 0.0 HME=105.0 HMD= 98.0

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH= 6 HUR=12.0

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MNDIP= -46.8 MAGLA= -29.1 XHIE= 74.8
 SUNRSE: 8.2 L.T. SUNSET:15.8 L.T. SUN DEC= 23.1
 NMF1=2.83%11 NMF1= 0.00%-01 NAME=6.92%10 NMD=4.00%08
 NMF2=2b1.4 NMF1= 0.0 HME=109.8 HMD= 81.3

H	NE	N/HMAX	TN	TE	TI	TE/TI	RDO+	RDO-	RDH+	RDH-	RD02+	RD02-	RDND+	RDND-
80.0	3.761%08	0.0013	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	7.129%08	0.0025	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	7.313%09	0.0028	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.900%10	0.1023	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	5.517%10	0.1947	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	6.770%10	0.2389	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	6.920%10	0.2442	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	6.445%10	0.2275	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	6.127%10	0.2163	300.0	300.0	1.0000	1.0000	0.385	0.000	0.000	0.000	28.639	28.639	71.310	71.310
125.0	6.648%10	0.2346	344.6	370.6	1.0752	1.0752	0.639	0.000	0.000	0.000	31.196	31.196	68.720	68.720
130.0	7.313%10	0.2581	388.0	439.9	1.1337	1.1337	1.059	0.000	0.000	0.000	33.963	33.963	65.898	65.898
135.0	7.534%10	0.2659	428.6	506.4	1.1815	1.1815	1.751	0.000	0.000	0.000	36.921	36.921	62.847	62.847
140.0	7.768%10	0.2742	464.7	568.4	1.2232	1.2232	2.884	0.000	0.000	0.000	39.985	39.985	59.630	59.630
145.0	8.290%10	0.2926	521.7	677.3	1.2982	1.2982	7.621	0.000	0.000	0.000	40.423	40.423	51.956	51.956
150.0	8.905%10	0.3143	562.1	769.5	1.3690	1.3690	18.578	0.000	0.000	0.000	42.899	42.899	56.462	56.462
155.0	9.667%10	0.3412	591.1	850.4	1.4386	1.4386	38.011	0.000	0.000	0.000	45.108	45.108	53.833	53.833
160.0	1.072%11	0.3785	612.8	924.0	1.5034	1.5034	59.970	0.000	0.000	0.000	45.888	45.888	52.361	52.361
165.0	1.315%11	0.4641	629.5	992.5	1.5562	1.5562	75.067	0.000	0.000	0.000	45.000	45.000	52.116	52.116
170.0	1.681%11	0.5932	642.8	1057.7	1.2982	1.2982	7.621	0.000	0.000	0.000	40.423	40.423	51.956	51.956
175.0	2.029%11	0.7162	653.5	1120.3	1.3690	1.3690	18.578	0.000	0.000	0.000	34.804	34.804	46.618	46.618
180.0	2.331%11	0.8225	662.3	1180.9	1.4386	1.4386	38.011	0.000	0.000	0.000	27.273	27.273	34.716	34.716
185.0	2.564%11	0.9048	669.5	1240.0	1.5034	1.5034	59.970	0.000	0.000	0.000	16.243	16.243	23.787	23.787
190.0	2.720%11	0.9601	675.5	1297.8	1.5562	1.5562	75.067	0.000	0.000	0.000	17.373	17.373	24.373	24.373
195.0	2.833%11	0.9999	684.6	1410.6	1.5999	1.5999	82.614	0.000	0.000	0.000	3.284	3.284	14.101	14.101
200.0	2.785%11	0.9830	690.9	1520.6	1.6370	1.6370	86.230	0.000	0.000	0.000	1.411	1.411	12.359	12.359
205.0	2.638%11	0.9309	695.3	1628.7	1.6689	1.6689	88.317	0.000	0.000	0.000	0.605	0.605	11.078	11.078
210.0	2.416%11	0.8527	698.4	1735.6	1.6967	1.6967	89.875	0.000	0.000	0.000	0.260	0.260	9.865	9.865
215.0	2.151%11	0.7593	700.6	1841.5	1.8461	1.8461	91.267	0.000	0.000	0.000	0.111	0.111	8.622	8.622
220.0	1.872%11	0.6607	702.2	1912.7	1.8509	1.8509	93.959	0.000	0.000	0.000	0.020	0.020	3.389	3.389
225.0	1.601%11	0.5650	703.4	1950.7	1.7952	1.7952	96.607	0.000	0.000	0.000	0.004	0.004	1.999	1.999
230.0	1.353%11	0.4775	704.3	1989.5	1.8227	1.8227	98.079	0.000	0.000	0.000	0.001	0.001	1.913	1.913
235.0	1.136%11	0.4008	704.9	2027.2	1.7211	1.7211	91.267	0.000	0.000	0.000	0.000	0.000	0.856	0.856
240.0	0.9514%10	0.3358	705.4	2065.1	1.7620	1.7620	93.959	0.000	0.000	0.000	0.157	0.157	3.389	3.389
245.0	0.7985%10	0.2818	705.8	2103.3	1.8055	1.8055	98.083	0.000	0.000	0.000	0.029	0.029	1.999	1.999
250.0	0.6735%10	0.2377	706.1	2141.4	1.8227	1.8227	98.079	0.000	0.000	0.000	0.005	0.005	1.92	1.92
255.0	0.5724%10	0.2020	706.4	2179.7	1.7212	1.7212	98.071	0.000	0.000	0.000	0.000	0.000	1.93	1.93
260.0	0.4909%10	0.1733	706.6	2217.9	1.729.7	1.729.7	97.943	0.000	0.000	0.000	0.000	0.000	1.847	1.847
265.0	0.4255%10	0.1502	706.7	2256.2	1.6794	1.6794	91.581	0.176	0.000	0.000	0.000	0.000	0.157	0.157
270.0	0.3729%10	0.1316	706.8	2294.5	1.6379	1.6379	91.699	0.189	0.000	0.000	0.000	0.000	0.205	0.205
275.0	0.3055%10	0.1167	706.9	2332.7	1.5978	1.5978	95.386	4.153	0.461	0.000	0.000	0.000	1.367	1.367
280.0	0.2744%10	0.1046	707.0	2371.0	1.5601	1.5601	93.872	5.516	0.613	0.000	0.000	0.000	0.000	0.000
285.0	0.2409%10	0.0947	707.1	2409.3	1.5250	1.5250	92.369	6.868	0.763	0.000	0.000	0.000	0.000	0.000
290.0	0.2167%10	0.0867	707.2	2447.6	1.4925	1.4925	90.872	8.215	0.913	0.000	0.000	0.000	0.000	0.000
295.0	0.1921%10	0.0801	707.3	2485.8	1.4623	1.4623	89.373	9.564	1.063	0.000	0.000	0.000	0.000	0.000
300.0	0.1721%10	0.0608	707.4	2524.1	1.4342	1.4342	87.864	10.923	1.214	0.000	0.000	0.000	0.000	0.000
305.0	0.1559%10	0.0586	707.5	2562.4	1.4081	1.4081	86.329	12.303	1.367	0.000	0.000	0.000	0.000	0.000
310.0	0.1409%10	0.0502	707.6	2600.7	1.3836	1.3836	84.756	13.720	1.524	0.000	0.000	0.000	0.000	0.000
315.0	0.1304%10	0.0465	707.7	2639.0	1.3607	1.3607	83.125	15.188	1.688	0.000	0.000	0.000	0.000	0.000
320.0	0.1217%10	0.0416	707.8	2677.2	1.3392	1.3392	81.420	16.722	1.858	0.000	0.000	0.000	0.000	0.000
325.0	0.1136%10	0.0358	707.9	2715.5	1.3191	1.3191	79.628	18.335	2.037	0.000	0.000	0.000	0.000	0.000
330.0	0.1050%10	0.02818	708.0	2753.8	1.3001	1.3001	77.745	20.029	2.225	0.000	0.000	0.000	0.000	0.000
335.0	0.0963%10	0.02377	708.1	2785.4	1.2821	1.2821	75.777	21.801	2.422	0.000	0.000	0.000	0.000	0.000
340.0	0.0884%10	0.01665	708.2	2820.4	1.2652	1.2652	73.739	23.635	2.626	0.000	0.000	0.000	0.000	0.000
345.0	0.0801	0.01316	708.3	2858.8	1.2452	1.2452	71.655	25.511	2.835	0.000	0.000	0.000	0.000	0.000
350.0	0.0729%10	0.01167	708.4	2895.8	1.2252	1.2252	70.745	27.406	3.045	0.000	0.000	0.000	0.000	0.000
355.0	0.0659%10	0.01046	708.5	2933.8	1.2052	1.2052	69.549	27.443	3.256	0.000	0.000	0.000	0.000	0.000
360.0	0.0606%10	0.00947	708.6	2971.3	1.1852	1.1852	68.343	29.301	3.443	0.000	0.000	0.000	0.000	0.000
365.0	0.0550%10	0.00867	708.7	3009.8	1.1652	1.1652	67.143	30.201	3.643	0.000	0.000	0.000	0.000	0.000
370.0	0.0497%10	0.00801	708.8	3048.4	1.1452	1.1452	66.043	31.101	3.843	0.000	0.000	0.000	0.000	0.000
375.0	0.0449%10	0.00741	708.9	3086.4	1.1252	1.1252	65.043	32.001	4.043	0.000	0.000	0.000	0.000	0.000
380.0	0.0409%10	0.00665	709.0	3124.4	1.1052	1.1052	64.143	32.901	4.242	0.000	0.000	0.000	0.000	0.000
385.0	0.0372%10	0.00634	709.1	3162.4	1.0852	1.0852	63.343	33.801	4.443	0.000	0.000	0.000	0.000	0.000
390.0	0.0342%10	0.00608	709.2	3200.4	1.0652	1.0652	62.643	34.701	4.643	0.000	0.000	0.000	0.000	0.000
395.0	0.0312%10	0.00586	709.3	3238.4	1.0452	1.0452	62.043	35.601	4.843	0.000	0.000	0.000	0.000	0.000
400.0	0.0282%10	0.00565	709.4	3276.4	1.0252	1.0252	61.543	36.501	5.043	0.000	0.000	0.000	0.000	0.000
405.0	0.0255%10	0.00542	709.5	3314.4	1.0052	1.0052	61.143	37.401	5.243	0.000	0.000	0.000	0.000	0.000
410.0	0.0230%10	0.00516	709.6	3352.4	985.2	985.2	60.843	38.301	5.443	0.000	0.000	0.000	0.000	0.000
415.0	0.0217%10	0.00491	709.7	3390.4	965.0	965.0	60.643	39.201	5.643	0.000	0.000	0.000	0.000	0.000
420.0	0.0204%10	0.00466	709.8	3428.4	945.2	945.2	60.443	40.101	5.843	0.000	0.000	0.000	0.000	0.000
425.0</td														

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH= 6 HOUR= 8,2

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MDDIP= -46.8 MAGLA= -29.1 XH1= 90.0
 SUNRISE: 8.2 L.T. SUNSET: 15.8 L.T. SUN DEC.= 23.1
 NMF2=1.43%11 HMF1= 0.00%01 NME=3.31%10 NMD=4.00%08
 HMF2=279.0 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDO+	RDHE+	RDO2+	RDHE2+	RDN0+
80.0	2.824%08	0.0020	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.099%08	0.0029	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.812%09	0.0127	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.178%10	0.0827	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.670%10	0.1874	-1	-1	-1	-1	0.003	0.000	0.000	0.000	17.568
105.0	3.285%10	0.2305	-1	-1	-1	-1	0.006	0.000	0.000	0.000	82.429
110.0	3.196%10	0.2243	-1	-1	-1	-1	0.012	0.000	0.000	0.000	20.399
115.0	2.620%10	0.1839	-1	-1	-1	-1	0.023	0.000	0.000	0.000	79.595
120.0	2.073%10	0.1455	291.5	291.5	291.5	291.5	0.044	0.000	0.000	0.000	23.675
125.0	1.834%10	0.1287	332.9	350.8	332.9	1.0539	0.084	0.000	0.000	0.000	76.313
130.0	1.925%10	0.1351	373.0	408.9	373.0	1.0962	0.161	0.000	0.000	0.000	27.442
135.0	2.227%10	0.1563	410.3	464.2	410.3	1.1312	0.307	0.000	0.000	0.000	72.535
140.0	2.599%10	0.1824	442.9	514.7	442.9	1.1621	0.584	0.000	0.000	0.000	45.000
145.0	3.419%10	0.2399	493.4	601.1	493.4	1.2183	2.074	0.000	0.000	0.000	54.416
150.0	3.662%10	0.2570	528.1	671.7	528.1	1.2719	6.909	0.000	0.000	0.000	68.258
155.0	3.943%10	0.2767	552.6	732.1	552.6	1.3248	19.661	0.000	0.000	0.000	63.621
160.0	4.279%10	0.3003	570.7	786.1	573.5	1.3709	41.885	0.000	0.000	0.000	36.294
165.0	4.704%10	0.3301	584.6	835.9	594.3	1.4066	63.787	0.000	0.000	0.000	40.794
170.0	5.320%10	0.3733	595.5	882.7	615.1	1.4351	76.967	0.000	0.000	0.000	30.703
175.0	6.796%10	0.4769	604.4	927.4	635.9	1.4584	83.288	0.000	0.000	0.000	49.636
180.0	8.671%10	0.6085	611.5	970.5	656.7	1.4778	86.496	0.000	0.000	0.000	21.641
185.0	1.044%11	0.7323	617.5	1012.4	677.6	1.4941	88.560	0.000	0.000	0.000	36.474
190.0	1.193%11	0.8374	622.4	1053.1	698.4	1.5080	90.243	0.000	0.000	0.000	10.559
195.0	1.379%11	0.9681	629.8	1132.4	740.0	1.5302	93.359	0.000	0.000	0.000	4.137
200.0	1.425%11	1.0000	634.9	1209.3	781.6	1.5471	96.398	0.000	0.000	0.000	1.545
205.0	1.396%11	0.9797	638.5	1284.7	823.3	1.5605	98.000	0.000	0.000	0.000	0.573
210.0	1.321%11	0.9269	641.0	1359.0	864.9	1.5713	98.100	0.000	0.000	0.000	12.931
215.0	1.212%11	0.8505	642.8	1432.6	906.4	1.5805	98.101	1.044	0.000	0.000	0.212
220.0	1.083%11	0.7603	644.2	1487.4	947.9	1.5692	98.099	1.620	0.000	0.000	0.079
225.0	9.488%10	0.6658	645.1	1524.1	988.9	1.5411	98.096	1.701	0.000	0.000	0.011
230.0	8.184%10	0.5743	645.8	1561.1	1029.1	1.5169	98.093	1.715	0.000	0.000	0.630
235.0	6.989%10	0.4904	646.4	1580.8	1067.6	1.4807	98.084	1.724	0.000	0.000	3.600
240.0	5.938%10	0.4167	646.8	1600.6	1103.4	1.4506	97.991	1.044	0.000	0.000	0.739
245.0	5.041%10	0.3537	647.1	1620.5	1136.6	1.4258	98.099	1.680	0.000	0.000	0.101
250.0	4.291%10	0.3011	647.3	1640.4	1168.0	1.4045	95.399	1.701	0.000	0.000	0.014
255.0	3.673%10	0.2578	647.5	1660.4	1198.5	1.3854	93.884	1.715	0.000	0.000	0.002
260.0	3.169%10	0.2224	647.7	1680.3	1228.7	1.3676	92.381	1.724	0.000	0.000	0.000
265.0	2.759%10	0.1936	647.8	1700.3	1258.7	1.3508	90.884	1.735	0.000	0.000	0.000
270.0	2.426%10	0.1703	647.9	1720.3	1288.7	1.3348	89.386	1.755	0.000	0.000	0.000
275.0	2.157%10	0.1513	648.0	1740.2	1318.7	1.3196	87.876	1.776	0.000	0.000	0.000
280.0	1.938%10	0.1360	648.1	1760.2	1348.7	1.3051	86.341	1.796	0.000	0.000	0.000
285.0	1.759%10	0.0920	648.3	1860.1	1498.6	1.2413	77.756	2.020	0.000	0.000	0.000
290.0	1.243%10	0.0872	648.4	1780.2	1378.7	1.2912	84.767	1.709	0.000	0.000	0.000
295.0	1.613%10	0.1132	648.5	1800.2	1408.7	1.2780	83.136	1.718	0.000	0.000	0.000
300.0	1.492%10	0.1047	648.6	1820.2	1438.6	1.2652	81.431	1.722	0.000	0.000	0.000
305.0	1.388%10	0.0978	648.7	1840.1	1468.6	1.2530	79.639	1.732	0.000	0.000	0.000
310.0	1.098%10	0.0770	648.8	1860.1	1498.6	1.2413	77.756	2.020	0.000	0.000	0.000
315.0	1.064%10	0.0746	648.9	1880.1	1528.5	1.2300	75.787	21.791	0.000	0.000	0.000
320.0	3.071%10	0.0000	649.0	1900.1	1558.5	1.2192	73.749	23.626	0.000	0.000	0.000
325.0	0.0000	0.0000	649.1	1920.1	1588.5	1.2087	71.665	25.502	0.000	0.000	0.000
330.0	0.0000	0.0000	649.2	1940.0	1618.4	1.1987	69.558	27.398	0.044	0.000	0.000
335.0	0.0000	0.0000	649.3	1960.0	1648.4	1.1890	67.452	29.293	0.000	0.000	0.000
340.0	3.071%10	0.0000	649.4	1980.0	1678.4	1.1787	65.452	30.255	0.000	0.000	0.000

WE PUT B1= 3.071 GET HST

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH= 6 HOUR= 0.0

CALCULATED VALUES: HLAT= -40.5 MLNG= 9.8
 DTP= -48.0 MDIP= -46.8 MAGLA= 29.1 XHI= 151.4
 SUNRISE: 8.2 L.T. SUNSET: 15.8 L.T. SUN DEC.= 23.1
 NME2=9.23%10 NMFL1= 0.00%-01 NME=1.78%09 NMID=4.00%08
 NMFL2=281.6 HME=105.0 HMD= 88.0

	NE	TE/TI	T1	TE	TH	NE/IMAX	RDN+	RDNH+	RDN2+	RDN0+	RDN-
H	80.0 4.901%05	-1	-1	-1	-1	5.3%-6	-1	-1	-1	-1	-1
85.0 2.453%08	0.0027	-1	-1	-1	-1	0.0051	-1	-1	-1	-1	-1
90.0 4.720%08	0.0051	-1	-1	-1	-1	0.0189	-1	-1	-1	-1	-1
95.0 1.742%09	0.0189	-1	-1	-1	-1	1.775%09	0.0192	0.003	0.000	0.000	17.568
100.0 1.775%09	0.0192	-1	-1	-1	-1	1.449%09	0.0157	0.006	0.000	0.000	82.429
105.0 1.775%09	0.0192	-1	-1	-1	-1	1.420%08	0.0102	0.012	0.000	0.000	79.399
110.0 1.449%09	0.0157	-1	-1	-1	-1	9.430%08	0.0065	0.023	0.000	0.000	23.675
115.0 9.430%08	0.0102	-1	-1	-1	-1	5.991%08	0.0046	0.044	0.000	0.000	76.313
120.0 5.991%08	0.0065	0.000	0.000	0.000	0.000	3.897%08	0.0042	0.064	0.000	0.000	72.535
125.0 4.211%08	0.0046	0.000	0.000	0.000	0.000	6.479%08	0.0070	0.084	0.000	0.000	68.258
130.0 3.480%08	0.0038	0.000	0.000	0.000	0.000	3.480%08	0.0037	0.104	0.000	0.000	63.621
135.0 3.420%08	0.0037	0.000	0.000	0.000	0.000	4.420%08	0.0037	0.124	0.000	0.000	59.123
140.0 3.897%08	0.0042	0.000	0.000	0.000	0.000	429.1	429.1	0.144	0.000	0.000	55.754
145.0 6.479%08	0.0070	0.000	0.000	0.000	0.000	475.5	475.5	0.164	0.000	0.000	54.416
150.0 6.080%09	0.0117	0.000	0.000	0.000	0.000	506.9	506.9	0.184	0.000	0.000	56.044
160.0 1.668%09	0.0181	0.000	0.000	0.000	0.000	528.9	528.9	0.204	0.000	0.000	56.457
170.0 1.668%09	0.0181	0.000	0.000	0.000	0.000	544.9	544.9	0.224	0.000	0.000	49.625
180.0 1.031%10	0.1118	0.000	0.000	0.000	0.000	648.3	648.3	0.244	0.000	0.000	36.451
190.0 1.801%10	0.1952	0.000	0.000	0.000	0.000	554.9	554.9	0.264	0.000	0.000	25.620
200.0 2.761%10	0.2992	0.000	0.000	0.000	0.000	677.9	677.9	0.284	0.000	0.000	18.857
210.0 3.907%10	0.4235	0.000	0.000	0.000	0.000	704.7	704.7	0.304	0.000	0.000	15.125
220.0 5.145%10	0.5576	0.000	0.000	0.000	0.000	574.6	729.7	0.324	0.000	0.000	12.890
230.0 6.354%10	0.6886	0.000	0.000	0.000	0.000	581.0	753.3	0.344	0.000	0.000	11.188
240.0 7.417%10	0.8039	0.000	0.000	0.000	0.000	590.5	677.9	0.364	0.000	0.000	9.641
260.0 8.816%10	0.9556	0.000	0.000	0.000	0.000	597.0	838.2	0.384	0.000	0.000	6.599
280.0 9.225%10	0.9998	0.000	0.000	0.000	0.000	601.5	877.2	0.404	0.000	0.000	3.582
300.0 9.086%10	0.9848	0.000	0.000	0.000	0.000	604.6	914.8	0.424	0.000	0.000	2.000
320.0 8.650%10	0.9376	0.000	0.000	0.000	0.000	606.9	951.5	0.444	0.000	0.000	1.231
340.0 7.992%10	0.8662	0.000	0.000	0.000	0.000	608.4	987.6	0.464	0.000	0.000	0.169
360.0 7.197%10	0.7801	0.000	0.000	0.000	0.000	609.6	1023.2	0.484	0.000	0.000	0.023
380.0 6.351%10	0.6884	0.000	0.000	0.000	0.000	610.4	1058.5	0.504	0.000	0.000	0.003
400.0 5.519%10	0.5982	0.000	0.000	0.000	0.000	611.1	1093.6	0.524	0.000	0.000	0.000
420.0 4.749%10	0.5147	0.000	0.000	0.000	0.000	611.5	1093.6	0.544	0.000	0.000	0.000
440.0 4.063%10	0.4404	0.000	0.000	0.000	0.000	611.9	1093.6	0.564	0.000	0.000	0.000
460.0 3.473%10	0.3764	0.000	0.000	0.000	0.000	612.2	1093.6	0.584	0.000	0.000	0.000
480.0 2.975%10	0.3224	0.000	0.000	0.000	0.000	612.4	1093.6	0.604	0.000	0.000	0.000
500.0 2.561%10	0.2776	0.000	0.000	0.000	0.000	612.6	1093.6	0.624	0.000	0.000	0.000
520.0 2.221%10	0.2407	0.000	0.000	0.000	0.000	612.7	1093.7	0.644	0.000	0.000	0.000
540.0 1.943%10	0.1910	0.000	0.000	0.000	0.000	612.8	1093.7	0.664	0.000	0.000	0.000
560.0 1.716%10	0.1860	0.000	0.000	0.000	0.000	612.9	1093.7	0.684	0.000	0.000	0.000
580.0 1.531%10	0.1660	0.000	0.000	0.000	0.000	613.0	1093.7	0.704	0.000	0.000	0.000
600.0 1.380%10	0.1496	0.000	0.000	0.000	0.000	613.1	1093.7	0.724	0.000	0.000	0.000
620.0 1.257%10	0.1362	0.000	0.000	0.000	0.000	613.1	1093.7	0.744	0.000	0.000	0.000
640.0 1.155%10	0.1252	0.000	0.000	0.000	0.000	613.1	1093.7	0.764	0.000	0.000	0.000
660.0 1.072%10	0.1162	0.000	0.000	0.000	0.000	613.2	1093.7	0.784	0.000	0.000	0.000
680.0 1.002%10	0.1087	0.000	0.000	0.000	0.000	613.2	1093.7	0.804	0.000	0.000	0.000
700.0 9.450%09	0.1024	0.000	0.000	0.000	0.000	613.2	1093.7	0.824	0.000	0.000	0.000
720.0 8.971%09	0.0972	0.000	0.000	0.000	0.000	613.3	1093.8	0.844	0.000	0.000	0.000
740.0 8.571%09	0.0929	0.000	0.000	0.000	0.000	613.3	1093.8	0.864	0.000	0.000	0.000
760.0 8.235%09	0.0893	0.000	0.000	0.000	0.000	613.3	1093.8	0.884	0.000	0.000	0.000
780.0 7.952%09	0.0862	0.000	0.000	0.000	0.000	613.3	1093.8	0.904	0.000	0.000	0.000
800.0 7.714%09	0.0836	0.000	0.000	0.000	0.000	613.3	1093.8	0.924	0.000	0.000	0.000
WE PUT R1= 3.0TU GET HST											

INPUT: LAT= -51.7 LONG= 302.2 R= 10 MINTH=12 HNUR=12.0

CALCULATED VALUES: NLAT= -40.5 NLNG= 9.8
 DIP= -48.0 MNIDP= -46.8 HAGLA= -29.1 XHI= 28.8
 SUNRISE: 3.8 L.T. SUNSET: 20.2 L.T. SUN DEC. = -22.9
 NMF2=7.11%11 HMF1= 2.42%11 HME=1.27%11 NHD=6.01%08
 HNF2=307.7 HMF1=254.5 HME=110.0 HMD= 81.0

H	HE	N/NMAX	TN	TE	TI	TE/TI	RDN+	RDHE+	RDN2+	RDHE2+	RDN3+
80.0	5.734%08	8.1%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	1.207%09	0.0017	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.251%10	0.0176	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	5.005%10	0.0704	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	9.804%10	0.1379	-1	-1	-1	-1	0.222	0.000	0.000	44.165	55.613
105.0	1.231%11	0.1732	-1	-1	-1	-1	0.322	0.000	0.000	41.891	57.787
110.0	1.267%11	0.1782	-1	-1	-1	-1	0.466	0.000	0.000	39.792	59.742
115.0	1.234%11	0.1736	-1	-1	-1	-1	0.674	0.000	0.000	37.926	61.400
120.0	1.215%11	0.1709	307.8	307.8	307.8	1.0000	0.973	0.000	0.000	36.383	62.45
125.0	1.266%11	0.1781	355.4	380.9	355.4	1.0718	1.397	0.000	0.000	35.215	63.388
130.0	1.286%11	0.1809	401.7	452.8	401.7	1.1271	1.992	0.000	0.000	34.358	63.650
135.0	1.292%11	0.1818	445.4	522.0	445.4	1.1719	2.806	0.000	0.000	33.684	63.511
140.0	1.299%11	0.1827	484.7	586.8	484.7	1.2106	3.879	0.000	0.000	33.097	63.025
150.0	1.313%11	0.1847	548.2	701.3	548.2	1.2794	6.785	0.000	0.000	32.022	61.193
160.0	1.330%11	0.1870	594.3	798.5	594.3	1.3436	10.186	0.000	0.000	31.000	58.814
170.0	1.349%11	0.1897	628.0	883.2	628.0	1.4064	13.415	0.000	0.000	29.997	56.588
180.0	1.370%11	0.1928	653.5	959.8	653.5	1.4687	16.465	0.000	0.000	10.593	57.337
190.0	1.396%11	0.1963	673.3	1030.6	675.6	1.5256	19.639	0.000	0.000	27.130	53.231
200.0	1.426%11	0.2006	689.1	1097.5	697.6	1.5731	23.189	0.000	0.000	22.712	54.099
210.0	1.463%11	0.2058	701.9	1161.3	719.7	1.6136	27.286	0.000	0.000	16.065	56.649
220.0	1.511%11	0.2126	712.4	1222.9	741.8	1.6486	32.070	0.000	0.000	10.593	54.624
230.0	1.578%11	0.2219	721.1	1282.6	763.9	1.6791	37.679	0.000	0.000	6.897	55.424
240.0	1.703%11	0.2395	728.3	1340.9	785.9	1.7061	44.264	0.000	0.000	4.482	51.255
260.0	3.208%11	0.4513	739.2	1453.9	830.1	1.7515	61.068	0.000	0.000	1.892	37.040
280.0	5.804%11	0.8164	746.8	1563.6	874.2	1.7885	83.427	0.000	0.000	0.798	15.775
300.0	7.036%11	0.9897	752.1	1671.0	918.4	1.8194	98.000	0.000	0.000	0.337	1.663
320.0	7.045%11	0.9909	755.9	1776.8	962.6	1.8459	98.986	0.000	0.000	0.142	0.872
340.0	6.690%11	0.9411	758.5	1881.5	1006.8	1.8688	99.004	0.000	0.000	0.060	0.936
360.0	6.098%11	0.8577	760.5	1952.2	1051.3	1.88569	99.003	0.511	0.057	0.025	0.404
380.0	5.367%11	0.7549	761.9	2019.3	1096.2	1.8156	99.000	0.737	0.082	0.011	0.171
400.0	4.593%11	0.6461	762.9	2029.2	1142.3	1.7764	98.996	0.834	0.093	0.005	0.002
420.0	3.850%11	0.5416	763.7	2068.6	1190.8	1.7372	98.986	0.882	0.098	0.002	0.030
440.0	3.184%11	0.4478	764.3	2108.2	1242.8	1.6963	98.864	1.010	0.112	0.001	0.013
460.0	2.614%11	0.3676	764.8	2148.0	1298.5	1.6543	97.803	1.972	0.219	0.000	0.005
480.0	2.143%11	0.3014	765.2	2187.9	1356.5	1.6129	96.278	3.348	0.372	0.000	0.002
500.0	1.763%11	0.2480	765.5	2227.8	1475.3	1.5737	94.749	4.725	0.525	0.000	0.001
520.0	1.461%11	0.2055	765.7	2267.8	1475.3	1.5371	93.232	6.077	0.677	0.000	0.000
540.0	1.223%11	0.1720	765.9	2307.7	1535.2	1.5032	91.722	7.450	0.828	0.000	0.000
560.0	1.036%11	0.1457	766.0	2347.7	1595.1	1.4718	90.209	8.812	0.979	0.000	0.000
580.0	8.893%10	0.1251	766.2	2387.7	1655.1	1.4426	88.685	10.183	1.131	0.000	0.000
600.0	7.738%10	0.1088	766.3	2427.6	1715.0	1.4155	87.137	11.577	1.286	0.000	0.000
620.0	6.824%10	0.0960	766.4	2467.6	1775.0	1.3902	85.548	13.007	1.445	0.000	0.000
640.0	6.098%10	0.0858	766.4	2507.6	1835.0	1.3666	83.902	14.488	1.610	0.000	0.000
660.0	5.517%10	0.0776	766.5	2547.7	1894.9	1.3444	82.181	16.037	1.782	0.000	0.000
680.0	5.049%10	0.0710	766.6	2587.6	1954.9	1.3236	80.373	17.665	1.963	0.000	0.000
700.0	4.670%10	0.0657	766.6	2627.5	2014.9	1.3041	78.472	19.375	2.153	0.000	0.000
720.0	4.362%10	0.0614	766.6	2667.5	2074.8	1.2857	76.485	21.163	2.351	0.000	0.000
740.0	4.110%10	0.0578	766.7	2707.5	2134.8	1.2683	74.429	23.014	2.557	0.000	0.000
760.0	3.902%10	0.0549	766.7	2747.5	2194.8	1.2518	72.325	24.908	2.768	0.000	0.000
780.0	3.730%10	0.0525	766.7	2787.4	2254.7	1.2363	70.199	26.821	2.980	0.000	0.000
800.0	3.588%10	0.0505	766.7	2827.4	2314.7	1.2215	68.074	28.734	3.193	0.000	0.000
WE PUT	BL=	3.0TU GET HST									

INPUT: LATI= -51.7 LONGI= 302.2 R= 10 MONTH=12 HOUR= 3.8

CALCULATED VALUES: MLAT= -40.5 MLONG= 9.8
 DIP= -48.0 MODIP= -46.8 MAGLA= -29.1 XHI= 90.0
 SUNRISE: 3.8 L.T. SUNSET: 20.2 L.T. SJN DEC.= -22.9
 NMF2=4.44%11 NMF1= 0.00%01 NME=2.94%10 NMD=4.00%08
 HMF2=281.8 HMF1= 0.0 HME=107.5 HMD= 84.5

			TE/TI	TI	TE	TN	NE	N/NMAX		RDD+	RDH+	RDE+	RDO2+	RDNO+
H			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
30.0	2.826%08	6.4% -4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
35.0	4.100%08	9.2% -4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
40.0	1.812%09	0.0041	-1	-1	-1	-1	-1	-1	-1	0.001	0.000	0.000	5.910	94.089
45.0	1.133%10	0.0255	-1	-1	-1	-1	-1	-1	-1	0.002	0.000	0.000	7.935	92.062
50.0	2.440%10	0.0550	-1	-1	-1	-1	-1	-1	-1	0.004	0.000	0.000	10.632	89.364
55.0	2.927%10	0.0660	-1	-1	-1	-1	-1	-1	-1	0.008	0.000	0.000	14.159	85.833
60.0	2.848%10	0.0642	-1	-1	-1	-1	-1	-1	-1	0.016	0.000	0.000	18.572	81.412
65.0	2.360%10	0.0532	-1	-1	-1	-1	-1	-1	-1	0.000	0.000	0.000	23.544	76.425
70.0	1.897%10	0.0427	294.7	294.7	1.0000	1.0000	1.0000	1.0000	1.0000	0.031	0.000	0.000	28.077	71.864
75.0	1.694%10	0.0382	337.4	355.0	337.4	1.0521	1.0521	1.0521	1.0521	0.059	0.000	0.000	31.036	68.853
80.0	1.772%10	0.0399	378.8	413.9	378.8	1.0929	1.0929	1.0929	1.0929	0.111	0.000	0.000	32.271	67.520
85.0	2.030%10	0.0457	417.3	470.1	417.3	1.1264	1.1264	1.1264	1.1264	0.210	0.000	0.000	32.099	67.197
90.0	2.348%10	0.0529	451.2	521.6	451.2	1.1559	1.1559	1.1559	1.1559	0.204	0.000	0.000	31.000	66.960
95.0	3.019%10	0.0680	504.1	609.6	504.1	1.2093	1.2093	1.2093	1.2093	0.256	0.000	0.000	29.795	65.637
100.0	3.476%10	0.0783	540.9	681.6	540.9	1.2601	1.2601	1.2601	1.2601	0.368	0.000	0.000	28.508	63.764
105.0	4.033%10	0.0909	567.1	743.0	567.1	1.3101	1.3101	1.3101	1.3101	0.488	0.000	0.000	26.569	62.541
110.0	4.729%10	0.1066	586.5	797.6	586.5	1.3571	1.3571	1.3571	1.3571	0.609	0.000	0.000	22.138	63.732
115.0	5.631%10	0.1269	601.4	847.6	601.4	1.3942	1.3942	1.3942	1.3942	0.730	0.000	0.000	15.634	66.585
120.0	6.884%10	0.1551	613.2	894.6	613.2	1.4240	1.4240	1.4240	1.4240	0.851	0.000	0.000	10.306	67.552
125.0	8.948%10	0.2016	622.7	939.3	622.7	1.4485	1.4485	1.4485	1.4485	1.000	0.000	0.000	6.709	65.816
130.0	1.436%11	0.3236	630.5	982.2	630.5	1.4688	1.4688	1.4688	1.4688	1.141	0.000	0.000	4.360	61.588
135.0	2.172%11	0.4893	636.8	1023.8	636.8	1.4859	1.4859	1.4859	1.4859	1.300	0.000	0.000	1.840	45.910
140.0	2.933%11	0.6609	642.1	1064.2	642.1	1.5005	1.5005	1.5005	1.5005	1.473	0.000	0.000	0.777	20.109
145.0	4.081%11	0.9195	650.1	1142.6	650.1	1.5240	1.5240	1.5240	1.5240	1.5419	0.000	0.000	0.328	1.672
150.0	4.436%11	0.9996	655.7	1218.5	655.7	1.5419	1.5419	1.5419	1.5419	1.5561	0.000	0.000	0.138	0.548
155.0	4.359%11	0.9822	659.6	1292.7	659.6	1.5677	1.5677	1.5677	1.5677	1.5775	0.000	0.000	0.058	0.603
160.0	4.111%11	0.9263	662.3	1365.8	662.3	1.5952	1.5952	1.5952	1.5952	1.6250	0.000	0.000	0.025	0.273
165.0	3.740%11	0.8427	664.3	1438.1	664.3	1.6240	1.6240	1.6240	1.6240	1.6566	0.000	0.000	0.010	0.115
170.0	3.300%11	0.7436	665.7	1491.4	665.7	1.6566	1.6566	1.6566	1.6566	1.6886	0.000	0.000	0.004	0.049
175.0	2.842%11	0.6404	666.7	1526.3	666.7	1.6886	1.6886	1.6886	1.6886	1.7334	0.000	0.000	0.002	0.021
180.0	2.404%11	0.5416	667.5	1561.5	667.5	1.7143	1.7143	1.7143	1.7143	1.7538	0.000	0.000	0.001	0.009
185.0	2.009%11	0.4526	668.1	1581.2	668.1	1.7494	1.7494	1.7494	1.7494	1.7947	0.000	0.000	0.000	0.004
190.0	1.668%11	0.3758	668.5	1601.1	668.5	1.7755	1.7755	1.7755	1.7755	1.8294	0.000	0.000	0.000	0.000
195.0	1.383%11	0.3117	668.9	1621.0	668.9	1.8011	1.8011	1.8011	1.8011	1.8510	0.000	0.000	0.000	0.000
200.0	1.151%11	0.2593	669.1	1640.9	669.1	1.8271	1.8271	1.8271	1.8271	1.8781	0.000	0.000	0.000	0.000
205.0	9.634%10	0.2171	669.4	1660.9	669.4	1.8535	1.8535	1.8535	1.8535	1.9197	0.000	0.000	0.000	0.000
210.0	8.137%10	0.1834	669.5	1680.9	669.5	1.8777	1.8777	1.8777	1.8777	1.9797	0.000	0.000	0.000	0.000
215.0	6.947%10	0.1565	669.7	1700.9	669.7	1.9041	1.9041	1.9041	1.9041	2.0257	0.000	0.000	0.000	0.000
220.0	6.000%10	0.1352	669.8	1720.9	669.8	1.9306	1.9306	1.9306	1.9306	2.0466	0.000	0.000	0.000	0.000
225.0	5.246%10	0.1182	669.9	1740.9	669.9	1.9569	1.9569	1.9569	1.9569	2.0853	0.000	0.000	0.000	0.000
230.0	4.643%10	0.1046	669.9	1760.9	669.9	1.9826	1.9826	1.9826	1.9826	2.1367	0.000	0.000	0.000	0.000
235.0	4.159%10	0.0937	670.0	1780.9	670.0	2.0081	2.0081	2.0081	2.0081	2.1721	0.000	0.000	0.000	0.000
240.0	3.769%10	0.0849	670.1	1800.9	670.1	2.0451	2.0451	2.0451	2.0451	2.2781	0.000	0.000	0.000	0.000
245.0	3.452%10	0.0778	670.1	1820.9	670.1	2.0811	2.0811	2.0811	2.0811	2.3350	0.000	0.000	0.000	0.000
250.0	3.194%10	0.0720	670.1	1840.9	670.1	2.1171	2.1171	2.1171	2.1171	2.4046	0.000	0.000	0.000	0.000
255.0	2.982%10	0.0672	670.2	1860.9	670.2	2.1531	2.1531	2.1531	2.1531	2.4794	0.000	0.000	0.000	0.000
260.0	2.807%10	0.0632	670.2	1880.9	670.2	2.1912	2.1912	2.1912	2.1912	2.5321	0.000	0.000	0.000	0.000
265.0	2.662%10	0.0600	670.2	1900.9	670.2	2.2271	2.2271	2.2271	2.2271	2.6553	0.000	0.000	0.000	0.000
270.0	2.542%10	0.0573	670.3	1920.9	670.3	2.2631	2.2631	2.2631	2.2631	2.7881	0.000	0.000	0.000	0.000
275.0	2.442%10	0.0550	670.3	1940.9	670.3	2.3011	2.3011	2.3011	2.3011	2.8209	0.000	0.000	0.000	0.000
280.0	2.358%10	0.0531	670.3	1960.9	670.3	2.3371	2.3371	2.3371	2.3371	2.8517	0.000	0.000	0.000	0.000
285.0	2.301%10	0.0511												

WE PUT B1= 3.0 TO GET HST

INPUT: LATI= -51.7 LONGI= 302.2 RE= 10 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MUDIP= -46.8 MAGLA= -29.1 XHI= 105.4
 SUNRISE: 3.8 L.T. SUNSET: 20.2 L.T. SUN DEC.= -22.9
 NMFL2=5.33%11 NMFL1= 0.00%-01 NMME=1.78%09 NMND=4.00%08
 HMFL2=300.6 HMFL1= 0.0 HME=105.1 HMD= 87.9

H	NE	TE/TI	TI	TE	TN	N/NMAX	NE	RDH*	RDHE*	RDQ+*	RDQ2+	RDNO+
80.0	1.387%06	2.6%-6	-1	-1	-1	-1	85.0	-1	-1	-1	-1	-1
85.0	2.677%08	5.0%-4	-1	-1	-1	-1	90.0	4.828%08	9.1%-4	-1	-1	-1
90.0	1.748%09	0.0033	-1	-1	-1	-1	95.0	1.775%09	0.0033	-1	-1	-1
100.0	1.775%09	0.0033	-1	-1	-1	-1	105.0	1.467%09	0.0028	-1	-1	-1
110.0	1.670%08	0.0018	-1	-1	-1	-1	115.0	9.687%08	0.0018	-1	-1	-1
120.0	6.258%08	0.0012	294.0	294.0	294.0	1.0000	125.0	4.472%08	8.4%-4	336.4	344.4	336.4
130.0	3.748%08	7.0%-4	377.5	393.6	377.5	1.0426	135.0	3.720%08	7.0%-4	439.9	415.7	415.7
140.0	4.255%08	8.0%-4	449.4	481.5	449.4	1.0580	150.0	6.992%08	0.0013	501.7	501.7	501.7
160.0	1.136%09	0.0021	538.0	602.4	538.0	1.1196	170.0	1.760%09	0.0033	644.3	563.9	563.9
180.0	4.671%09	0.0088	582.9	679.5	582.9	1.1426	190.0	1.106%10	0.0208	710.2	599.2	599.2
200.0	2.455%10	0.0461	609.2	737.9	615.3	1.1992	210.0	5.082%10	618.5	763.3	631.5	1.2087
220.0	9.506%10	0.1785	626.2	787.0	626.2	1.1426	230.0	1.576%11	0.2960	632.5	679.5	679.5
240.0	2.347%11	0.4407	637.6	830.7	637.6	1.1656	260.0	3.956%11	0.7428	645.5	870.7	712.4
280.0	5.026%11	0.9438	651.0	908.4	651.0	1.1854	300.0	5.325%11	1.0000	654.8	944.4	744.8
320.0	5.213%11	0.9790	657.5	979.2	657.5	1.1854	340.0	4.892%11	0.9186	659.4	1013.3	809.4
360.0	4.422%11	0.8303	660.8	1046.9	660.8	1.1992	380.0	3.874%11	0.7275	661.8	1080.1	904.2
400.0	3.312%11	0.6219	662.6	1113.0	662.6	1.2151	420.0	2.781%11	0.5223	663.1	1113.8	977.1
440.0	2.310%11	0.4338	663.6	1114.7	663.6	1.2215	480.0	1.577%11	0.2961	664.2	1116.3	1046.9
460.0	1.908%10	0.1735	664.7	1118.9	664.7	1.2451	500.0	1.308%11	0.2457	664.4	1117.2	991.0
500.0	1.094%11	0.2054	664.6	1118.0	664.6	1.261	520.0	5.989%10	0.1125	665.0	1121.4	992.9
540.0	9.238%10	0.4338	665.0	1122.2	665.0	1.273	560.0	7.894%10	0.1482	665.1	1123.1	999.5
560.0	7.894%10	0.0898	665.1	1123.1	665.1	1.282	580.0	6.831%10	0.1283	665.2	1123.9	997.0
580.0	6.831%10	0.0817	665.2	1124.7	665.2	1.291	600.0	5.989%10	0.0751	665.3	1124.7	1003.3
620.0	5.318%10	0.0199	665.3	1125.6	665.3	1.301	640.0	4.781%10	0.0654	665.4	1126.4	1004.5
640.0	4.781%10	0.0898	665.4	1126.4	665.4	1.311	660.0	4.348%10	0.0817	665.5	1127.3	1005.8
660.0	4.348%10	0.0588	665.5	1127.3	665.5	1.321	680.0	3.999%10	0.0751	665.6	1128.1	1008.3
700.0	3.714%10	0.0697	665.6	1128.9	665.6	1.331	720.0	3.481%10	0.0654	665.7	1129.8	1010.8
720.0	3.481%10	0.0543	665.7	1129.8	665.7	1.341	740.0	3.289%10	0.0618	665.8	1131.0	1010.8
760.0	3.131%10	0.0588	665.8	1131.0	665.8	1.351	780.0	2.999%10	0.0563	665.9	1132.8	1009.6
800.0	2.890%10	0.0543	665.9	1132.8	665.9	1.361	820.0	2.781%10	0.0543	666.0	1133.9	1010.8
WE PUT \$1= 4.5 TO GET HST												

INPUT: LATI= -51.7 LONGI= 302.2 R=100 MONTH= 3 HTRUR=12.0

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MODIP= -46.8 MAGLA= -29.1 XHI= 48.4
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC.= -3.3
 NMF2=1.39%12 HMF1= 3.13%11 NMDE=1.42%11 NMD=1.10%09
 HNF2=308.4 HMF1=204.1 HME=110.0 HMD= 81.0

	NE	TN	TE	TI	TE/TI	RD0+	RDH+	RDH+	RDH+	RD02+	RDHE+	RDHE+	RDND+
H	N/NMAX	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
80.0	1.047%09	7.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.186%09	0.0016	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.115%10	0.0152	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	7.195%10	0.0516	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	1.242%11	0.0870	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	1.404%11	0.1007	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	1.423%11	0.1021	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	1.381%11	0.0991	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	1.361%11	0.0976	336.1	1.0000	1.322	0.000	0.000	0.000	0.000	52.538	47.140	47.140	47.140
125.0	1.419%11	0.1018	394.5	1.0499	2.552	0.000	0.000	0.000	0.000	51.642	47.870	47.870	47.870
130.0	1.428%11	0.1025	451.6	1.0872	3.844	0.000	0.000	0.000	0.000	50.691	48.570	48.570	48.570
135.0	1.435%11	0.1030	506.6	1.1166	5.771	0.000	0.000	0.000	0.000	49.587	49.295	49.295	49.295
140.0	1.444%11	0.1036	558.2	1.1412	8.609	0.000	0.000	0.000	0.000	48.130	50.180	50.180	50.180
145.0	1.469%11	0.1054	637.0	1.1700	11.598	0.000	0.000	0.000	0.000	46.068	51.380	51.380	51.380
150.0	1.511%11	0.1084	647.7	1.1824	14.448	0.000	0.000	0.000	0.000	46.068	51.380	51.380	51.380
155.0	1.511%11	0.1133	719.2	1.2191	18.448	0.000	0.000	0.000	0.000	43.337	52.819	52.819	52.819
160.0	1.579%11	0.1133	775.6	1.2540	22.552	0.000	0.000	0.000	0.000	40.201	54.028	54.028	54.028
165.0	1.707%11	0.1225	820.5	1.2881	26.859	0.000	0.000	0.000	0.000	37.000	54.391	54.391	54.391
170.0	1.707%11	0.1225	856.5	1.3218	31.049	0.000	0.000	0.000	0.000	31.049	50.502	50.502	50.502
175.0	2.114%11	0.1517	856.8	1.322	31.049	0.000	0.000	0.000	0.000	31.049	38.689	38.689	38.689
180.0	2.114%11	0.2155	886.5	1.3555	35.534	0.000	0.000	0.000	0.000	25.777	22.852	22.852	22.852
185.0	3.004%11	0.3057	911.0	1.3892	38.060	0.000	0.000	0.000	0.000	20.552	11.826	11.826	11.826
190.0	4.260%11	0.4431	931.4	1.4229	39.554	0.000	0.000	0.000	0.000	2.639	6.538	6.538	6.538
195.0	6.175%11	0.5791	948.4	1.4569	90.823	0.000	0.000	0.000	0.000	1.856	6.119	6.119	6.119
200.0	8.071%11	0.5791	1056.9	1.4911	92.025	0.000	0.000	0.000	0.000	0.917	4.673	4.673	4.673
205.0	9.750%11	0.6996	1132.5	1.525	94.409	0.000	0.000	0.000	0.000	5.338	6.602	6.602	6.602
210.0	1.214%12	0.8714	1201.6	1.5543	94.409	0.000	0.000	0.000	0.000	0.454	2.783	2.783	2.783
215.0	1.339%12	0.9608	1265.6	1.6079	96.763	0.000	0.000	0.000	0.000	3.753	6.692	6.692	6.692
220.0	1.339%12	0.9608	1325.3	1.6544	98.000	0.000	0.000	0.000	0.000	0.224	1.776	1.776	1.776
225.0	1.389%12	0.9667	1719.0	1.6957	98.077	0.000	0.000	0.000	0.000	0.111	1.812	1.812	1.812
230.0	1.389%12	1017.4	1805.3	1.7329	98.077	0.000	0.000	0.000	0.000	0.055	1.321	1.321	1.321
235.0	1.331%12	0.9936	962.6	1.762	98.077	0.000	0.000	0.000	0.000	0.027	0.653	0.653	0.653
240.0	1.331%12	0.9548	1435.3	1.800	98.077	0.000	0.000	0.000	0.000	0.027	0.323	0.323	0.323
245.0	1.331%12	0.8869	1535.7	1.838	98.077	0.000	0.000	0.000	0.000	0.159	0.013	0.013	0.013
250.0	1.236%12	0.8869	1629.4	1.876	98.077	0.000	0.000	0.000	0.000	0.176	0.007	0.007	0.007
255.0	1.115%12	0.7997	1009.9	1.919	98.077	0.000	0.000	0.000	0.000	0.003	0.079	0.079	0.079
260.0	1.389%12	0.9936	1017.4	1.964	98.077	0.000	0.000	0.000	0.000	0.055	1.321	1.321	1.321
265.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.027	0.653	0.653	0.653
270.0	1.236%12	1034.4	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.124	0.013	0.013	0.013
275.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.159	0.007	0.007	0.007
280.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.176	0.007	0.007	0.007
285.0	0.9802%11	0.7033	1031.6	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
290.0	1.385%12	1036.4	1036.4	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
295.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
300.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
305.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
310.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
315.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
320.0	1.389%12	1036.4	1036.4	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
325.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
330.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
335.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
340.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
345.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
350.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
355.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
360.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
365.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
370.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
375.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
380.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
385.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
390.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
395.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
400.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
405.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
410.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
415.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
420.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
425.0	0.8451%11	0.6064	1033.2	2.065	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
430.0	1.331%12	0.9548	1022.7	1.989	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
435.0	1.236%12	1015.2	1026.6	1.949	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
440.0	1.115%12	1029.5	1029.5	1.987	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
445.0	1.389%12	1033.6	1033.6	2.026	98.077	0.000	0.000	0.000	0.000	0.186	0.003	0.003	0.003
450.0	0.8451%11</												

INPUT: LATI= -51.7 LONGI= 302.2 P=100 MONTH= 3 H1UR= 5.7

CALCULATED VALUES: NLAT= -40.5 NLNG= 9.8
 DTP= -48.0 MUNIP= -40.8 MAGLA= -29.1 XH= 90.0
 SUNRSE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC. = -3.3
 NHF2=3.94%11 HF1= 0.30%-01 HME=3.90%10 NMD=4.00%08
 HMF2=336.1 HF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/LMAX	TH	TE	T1	TE/T1	RDN+	RDHE+	RDN2+	RDHE2+	RDN3+	RDHE3+
80.0	2.826%08	7.2% -4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
35.0	4.100%08	0.0010	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.818%09	0.0046	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.245%10	0.0316	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.024%10	0.0767	-1	-1	-1	-1	-1	0.012	0.000	0.000	18.28%	81.70%
105.0	3.864%10	0.9981	-1	-1	-1	-1	0.019	0.000	0.000	21.00%	78.98%	78.98%
110.0	3.776%10	0.0958	-1	-1	-1	-1	0.030	0.000	0.000	24.06%	75.90%	75.90%
115.0	3.127%10	0.0794	-1	-1	-1	0.049	0.000	0.000	0.000	27.39%	72.56%	72.56%
120.0	2.514%10	0.0638	323.5	323.5	1.0000	0.079	0.000	0.000	0.000	30.72%	69.22%	69.22%
125.0	2.247%10	0.0570	377.1	390.1	1.0345	0.127	0.000	0.000	0.000	33.55%	66.31%	66.31%
130.0	2.348%10	0.0596	429.4	455.4	1.0606	0.205	0.000	0.000	0.000	35.46%	64.33%	64.33%
135.0	2.682%10	0.0681	479.3	518.3	1.0814	0.330	0.000	0.000	0.000	36.49%	63.17%	63.17%
140.0	3.093%10	0.0785	525.3	577.4	1.0990	0.537	0.000	0.000	0.000	37.00%	62.47%	62.47%
150.0	4.040%10	0.1025	602.8	680.9	1.1294	1.364	0.000	0.000	0.000	37.33%	61.30%	61.30%
160.0	4.383%10	0.1112	662.1	766.1	1.1571	3.437	0.000	0.000	0.000	36.73%	59.82%	59.82%
170.0	4.769%10	0.1210	707.2	837.2	1.1838	8.184	0.000	0.000	0.000	32.73%	59.08%	59.08%
180.0	5.210%10	0.1322	742.3	898.3	1.2102	17.092	0.000	0.000	0.000	24.18%	58.72%	58.72%
190.0	5.719%10	0.1452	770.0	952.1	1.2364	28.794	0.000	0.000	0.000	16.19%	55.01%	55.01%
200.0	6.320%10	0.1604	792.5	1000.5	1.2625	39.129	0.000	0.000	0.000	10.62%	50.24%	50.24%
210.0	7.049%10	0.1789	810.8	1044.9	1.2886	46.642	0.000	0.000	0.000	6.952	46.40%	46.40%
220.0	7.977%10	0.2025	826.0	1086.0	1.3148	52.531	0.000	0.000	0.000	4.547	42.92%	42.92%
230.0	9.287%10	0.2357	838.6	1124.6	1.3404	57.951	0.000	0.000	0.000	2.973	39.07%	39.07%
240.0	1.195%11	0.3032	849.0	1161.0	1.3631	63.480	0.000	0.000	0.000	1.945	34.57%	34.57%
260.0	2.051%11	0.5205	864.9	1229.0	1.4009	75.747	0.000	0.000	0.000	0.832	23.42%	23.42%
280.0	2.912%11	0.7391	876.0	1292.0	1.4312	89.778	0.000	0.000	0.000	0.356	9.86%	9.86%
300.0	3.555%11	0.9022	883.8	1351.8	1.4562	98.000	0.000	0.000	0.000	0.152	1.84%	1.84%
320.0	3.878%11	0.9842	889.2	1409.3	1.4775	98.535	0.000	0.000	0.000	0.065	1.400	1.400
340.0	3.938%11	0.9994	893.1	1496.0	1.4960	98.545	0.000	0.000	0.000	0.028	1.428	1.428
360.0	3.856%11	0.9786	896.0	1506.3	1.5050	1.4989	98.543	0.739	0.082	0.012	0.624	0.624
380.0	3.670%11	0.9314	898.1	1533.8	1.5307	1.4881	98.542	1.069	0.119	0.005	0.267	0.267
400.0	3.406%11	0.8644	899.6	1561.5	1.5615	1.4776	98.537	1.212	0.135	0.002	0.114	0.114
420.0	3.093%11	0.7851	900.8	1581.2	1.5835	1.4593	98.528	1.280	0.142	0.001	0.049	0.049
440.0	2.761%11	0.7008	901.7	1601.1	1.6113	1.4407	98.405	1.417	0.157	0.000	0.621	0.621
460.0	2.423%11	0.6175	902.3	1621.0	1.6401	1.4218	98.393	1.349	0.264	0.000	0.009	0.009
480.0	2.126%11	0.5395	904.3	1740.9	1.6695	1.4031	98.300	1.273	0.417	0.000	0.004	0.004
500.0	1.848%11	0.4691	903.3	1660.9	1.6993	1.3849	94.309	5.120	0.569	0.000	0.002	0.002
520.0	1.606%11	0.4075	903.7	1680.9	1.729.2	1.3675	92.799	6.480	0.720	0.000	0.000	0.000
540.0	1.397%11	0.3546	903.9	1700.9	1.759.2	1.3508	91.296	7.834	0.870	0.000	0.000	0.000
560.0	1.221%11	0.3100	904.2	1720.9	1.789.2	1.3349	89.790	9.189	1.021	0.000	0.000	0.000
580.0	1.074%11	0.2726	904.3	1740.9	1.819.2	1.3197	88.273	10.554	1.173	0.000	0.000	0.000
600.0	9.514%10	0.2415	904.5	1760.9	1.849.2	1.3052	86.732	11.941	1.327	0.000	0.000	0.000
620.0	8.498%10	0.2157	904.6	1780.9	1.879.2	1.2913	85.151	13.364	1.485	0.000	0.000	0.000
640.0	7.656%10	0.1943	904.7	1800.9	1.909.2	1.2780	83.512	14.839	1.649	0.000	0.000	0.000
660.0	6.959%10	0.1766	904.8	1820.9	1.939.2	1.2652	81.799	16.381	1.820	0.000	0.000	0.000
680.0	6.380%10	0.1619	904.9	1840.9	1.969.2	1.2530	79.999	18.001	2.000	0.000	0.000	0.000
700.0	5.899%10	0.1497	905.0	1860.9	1.999.2	1.2413	78.108	19.703	2.189	0.000	0.000	0.000
720.0	5.498%10	0.1395	905.0	1880.9	1.529.2	1.2300	76.130	21.483	2.387	0.000	0.000	0.000
740.0	5.162%10	0.1310	905.1	1900.9	1.559.2	1.2192	74.083	23.325	2.592	0.000	0.000	0.000
760.0	4.880%10	0.1239	905.1	1920.9	1.589.2	1.2087	71.989	25.210	2.601	0.000	0.000	0.000
780.0	4.643%10	0.1178	905.1	1940.9	1.619.2	1.1987	69.873	27.114	3.013	0.000	0.000	0.000
800.0	4.442%10	0.1127	905.2	1960.9	1.649.2	1.1890	67.758	29.018	3.224	0.000	0.000	0.000

WE PUT b1 = 3.0TD GET HST

INPUT: LATI= -51.7 LONGI= 302.2 R=100 MONTH= 3 HOUR= 0.0

CALCULATED VALUES: NLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MODIP= -46.8 HAGLA= -29.1 XHI= 125.0
 SUNRISE: 5.7 L.T. SUNSET: 18.3 L.T. SUN DEC. = -3.3
 NMF2=4.28%11. HMFI= 0.00%01 NME=3.20%09 NMHD=4.00%08
 HMFI=410.2 HME=105.0 HND= 88.0

H	NE	N/HMAX	TN	TE	T1	TE/T1	RD0+	RDHE+	RDH+	RD02+	RDHE2+	RDND+
80.0	5.771%05	1.3%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.487%08	5.8%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.735%08	0.0011	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.511%09	0.0059	-1	-1	-1	-1	-1	0.012	0.000	0.000	0.000	0.000
100.0	3.193%09	0.0075	-1	-1	-1	-1	0.019	0.000	0.000	0.000	0.000	0.000
105.0	3.201%09	0.0075	-1	-1	-1	-1	0.030	0.000	0.000	0.000	0.000	0.000
110.0	2.618%09	0.0061	-1	-1	-1	-1	0.049	0.000	0.000	0.000	0.000	0.000
115.0	1.707%09	0.0040	-1	-1	-1	-1	0.079	0.000	0.000	0.000	0.000	0.000
120.0	1.087%09	0.0025	321.9	321.9	1.0000	0.079	0.000	0.000	0.000	18.280	18.280	81.709
125.0	7.663%08	0.0018	374.9	378.7	1.0101	0.127	0.000	0.000	0.000	21.000	21.000	78.981
130.0	6.346%08	0.0015	426.5	434.1	1.0178	0.205	0.000	0.000	0.000	24.062	24.062	75.907
135.0	6.245%08	0.0015	475.9	487.2	1.0239	0.330	0.000	0.000	0.000	27.391	27.391	72.560
140.0	7.120%08	0.0017	521.2	536.3	1.0291	0.530	0.000	0.000	0.000	30.722	30.722	69.199
150.0	1.182%09	0.0028	597.2	597.2	1.0381	1.365	0.000	0.000	0.000	37.333	37.333	61.302
160.0	1.962%09	0.0046	655.0	685.3	1.0463	3.439	0.000	0.000	0.000	33.556	33.556	66.317
170.0	3.030%09	0.0071	698.8	736.7	1.0542	8.188	0.000	0.000	0.000	35.464	35.464	64.331
180.0	3.767%09	0.0088	732.7	778.2	1.0620	17.101	0.000	0.000	0.000	36.497	36.497	63.174
190.0	4.523%09	0.0106	759.6	812.6	1.0698	28.809	0.000	0.000	0.000	37.000	37.000	62.470
200.0	5.451%09	0.0127	781.2	841.8	1.0776	39.149	0.000	0.000	0.000	36.738	36.738	59.823
210.0	6.598%09	0.0154	798.9	867.1	1.0853	46.665	0.000	0.000	0.000	32.734	32.734	59.078
220.0	8.029%09	0.0188	813.5	889.3	1.0931	52.556	0.000	0.000	0.000	24.187	24.187	58.712
230.0	9.832%09	0.0230	825.6	908.9	1.1009	57.977	0.000	0.000	0.000	16.193	16.193	54.998
240.0	1.214%10	0.0284	835.6	926.5	1.1088	63.506	0.000	0.000	0.000	10.626	10.626	50.226
260.0	1.916%10	0.0448	851.0	957.0	1.1236	75.771	0.000	0.000	0.000	6.952	6.952	46.383
280.0	3.312%10	0.0774	861.6	982.8	1.1332	89.795	0.000	0.000	0.000	4.547	4.547	42.898
300.0	7.504%10	0.1754	869.1	1005.4	1.1389	98.000	0.000	0.000	0.000	2.973	2.973	39.050
320.0	1.527%11	0.3569	874.3	1025.8	1.1420	98.507	0.000	0.000	0.000	1.945	1.945	34.549
340.0	2.490%11	0.5822	878.1	1044.7	913.7	1.1435	98.473	0.085	0.028	0.028	0.028	0.653
360.0	3.386%11	0.7918	880.6	1062.6	928.9	1.1439	98.409	1.170	0.130	0.012	0.012	0.279
380.0	3.944%11	0.9338	882.8	1079.8	943.7	1.1442	98.303	1.415	0.157	0.005	0.005	9.849
400.0	4.252%11	0.9941	884.3	1096.4	957.3	1.1453	97.744	1.983	0.220	0.002	0.002	1.848
420.0	4.259%11	0.9958	885.4	1096.5	968.7	1.1320	94.393	5.026	0.558	0.001	0.001	1.428
440.0	4.117%11	0.99627	886.3	1096.7	976.5	1.1230	89.978	9.011	1.001	0.000	0.000	0.653
460.0	3.859%11	0.9024	886.9	1096.8	980.9	1.1182	85.613	12.945	1.638	0.000	0.000	0.279
480.0	3.524%11	0.4898	888.7	1097.4	984.9	1.1159	81.296	16.832	1.870	0.000	0.000	0.002
500.0	3.150%11	0.7364	888.8	1097.0	983.9	1.1150	76.989	20.710	2.301	0.000	0.000	0.001
520.0	2.772%11	0.6481	888.2	1097.2	984.4	1.1146	72.650	24.615	2.735	0.000	0.000	0.000
540.0	2.416%11	0.5648	888.5	1097.3	984.7	1.1144	68.251	28.574	3.175	0.000	0.000	0.000
560.0	2.095%11	0.4898	888.7	1097.4	984.9	1.1142	63.782	32.596	3.622	0.000	0.000	0.000
580.0	1.816%11	0.4247	888.8	1097.6	985.1	1.1141	59.261	36.665	4.074	0.000	0.000	0.000
600.0	1.580%11	0.3693	889.0	1097.7	985.3	1.1140	54.736	40.737	4.526	0.000	0.000	0.000
620.0	1.382%11	0.3232	889.1	1097.8	985.5	1.1139	50.276	44.751	4.972	0.000	0.000	0.000
640.0	1.219%11	0.2850	889.2	1098.0	985.7	1.1138	45.955	48.641	5.405	0.000	0.000	0.000
660.0	1.085%11	0.2537	889.3	1098.1	985.9	1.1138	41.836	52.347	5.816	0.000	0.000	0.000
680.0	9.754%10	0.2281	889.4	1098.2	986.1	1.1137	37.968	55.828	6.203	0.000	0.000	0.000
700.0	8.857%10	0.2071	889.4	1098.4	986.3	1.1136	34.378	59.060	6.562	0.000	0.000	0.000
720.0	8.123%10	0.1899	889.5	1098.5	986.5	1.1135	31.033	62.033	6.893	0.000	0.000	0.000
740.0	7.520%10	0.1758	889.5	1098.6	986.7	1.1134	28.055	64.750	7.194	0.000	0.000	0.000
760.0	7.024%10	0.1642	889.6	1098.7	986.9	1.1133	25.308	67.223	7.469	0.000	0.000	0.000
780.0	6.615%10	0.1547	889.6	1098.7	987.1	1.1132	22.817	69.464	7.718	0.000	0.000	0.000
800.0	6.277%10	0.1468	889.7	1099.0	987.3	1.1131	20.564	71.493	7.944	0.000	0.000	0.000
WE PUT BL= 3.070 GET HST												

INPUT: LATI= -51.7 LONG1= 302.2 R=100 MONTH= 6 HOUR=12.0

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MODIP= -46.8 MAGLA= -29.1 XH1= 74.8
 SUNRISE: 8.2 L.T. SUNSET:15.8 L.T. SUN DEC.= 23.1
 NMF2=8.27%11 NMFL1= 0.00%01 NME=8.93%10 NMD=4.00%08
 HMF2=309.5 HMFL1= 0.0 HME=109.8 HMD= 81.3

H	NE	N/NMAX	TN	TE	T1	TE/T1	RD0+	RD0-	RD02+	RD02-	RDHE+	RDHE-
80.0	3.761%08	4.5%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	7.129%08	8.6%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	7.542%09	0.0091	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	3.251%10	0.0393	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	6.721%10	0.0813	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	8.656%10	0.1047	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	8.933%10	0.1081	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	8.321%10	0.1007	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	7.910%10	0.0957	331.4	331.4	1.0000	0.385	0.000	0.000	28.639	28.639	71.310	71.310
125.0	8.582%10	0.1038	388.1	408.1	1.0516	0.639	0.000	0.000	42.899	42.899	56.462	56.462
130.0	9.403%10	0.1137	443.3	483.4	1.0904	1.059	0.000	0.000	45.108	45.108	53.833	53.833
135.0	9.970%10	0.1206	496.5	556.6	1.1211	1.751	0.000	0.000	45.888	45.888	52.361	52.361
140.0	1.059%11	0.1280	546.0	626.2	1.1468	2.884	0.000	0.000	45.000	45.000	52.116	52.116
145.0	1.198%11	0.1450	631.0	751.3	1.1906	7.621	0.000	0.000	40.423	40.423	51.956	51.956
150.0	1.368%11	0.1654	697.8	858.1	1.2298	18.578	0.000	0.000	34.804	34.804	46.618	46.618
155.0	1.579%11	0.1909	749.8	950.2	1.2673	38.011	0.000	0.000	27.273	27.273	34.716	34.716
160.0	1.856%11	0.2245	790.8	1031.3	1.3041	59.970	0.000	0.000	16.243	16.243	23.787	23.787
165.0	2.269%11	0.2745	823.7	1104.3	1.3406	75.067	0.000	0.000	7.561	7.561	17.373	17.373
170.0	3.687%11	0.4460	850.5	1171.1	1.3770	82.614	0.000	0.000	3.284	3.284	14.101	14.101
175.0	4.467%11	0.5404	872.5	1233.2	1.4135	86.230	0.000	0.000	1.411	1.411	12.359	12.359
180.0	5.242%11	0.6341	890.8	1291.6	1.4500	88.317	0.000	0.000	0.605	0.605	11.078	11.078
185.0	5.973%11	0.7225	905.9	1346.9	1.4865	89.875	0.000	0.000	0.260	0.260	9.865	9.865
190.0	6.793%11	0.7225	918.6	1399.6	1.5204	91.267	0.000	0.000	0.111	0.111	8.622	8.622
195.0	7.179%11	0.8684	937.9	1499.1	1.5788	93.959	0.000	0.000	0.020	0.020	6.020	6.020
200.0	7.931%11	0.9594	951.4	1592.7	1.6277	96.607	0.000	0.000	0.004	0.004	3.389	3.389
205.0	8.239%11	0.9966	960.8	1682.3	1.6698	98.000	0.000	0.000	0.001	0.001	1.999	1.999
210.0	8.228%11	0.9953	967.5	1769.1	1.7067	98.087	0.000	0.000	0.000	0.000	1.913	1.913
215.0	7.949%11	0.9615	972.2	1854.0	1.7397	98.087	0.000	0.000	0.000	0.000	0.956	0.956
220.0	7.445%11	0.9006	975.7	1914.1	1.7477	98.086	1.581	0.176	0.000	0.000	0.157	0.157
225.0	6.786%11	0.8209	978.2	1951.4	1.7336	98.083	1.699	0.189	0.000	0.000	0.029	0.029
230.0	6.044%11	0.7311	980.1	1989.5	1.7179	98.079	1.724	0.192	0.000	0.000	0.005	0.005
235.0	5.285%11	0.6392	981.5	2027.2	1.7397	98.071	1.735	0.193	0.000	0.000	0.001	0.001
240.0	4.558%11	0.5514	982.6	2065.1	1.6681	97.948	1.847	0.205	0.000	0.000	0.000	0.000
245.0	3.896%11	0.4713	983.4	2103.3	1.6333	96.897	2.793	0.310	0.000	0.000	0.000	0.000
250.0	3.315%11	0.4010	984.1	2141.4	1.5961	95.386	4.153	0.461	0.000	0.000	0.000	0.000
255.0	2.817%11	0.3408	984.6	2179.7	1.5595	93.872	5.516	0.613	0.000	0.000	0.000	0.000
260.0	2.400%11	0.2903	985.0	2217.9	1.5248	92.369	6.868	0.763	0.000	0.000	0.000	0.000
265.0	2.054%11	0.2485	985.3	2256.2	1.511.8	1.4924	90.872	8.215	0.913	0.000	0.000	0.000
270.0	1.770%11	0.2141	985.6	2294.5	1.569.1	1.4623	89.373	9.564	1.063	0.000	0.000	0.000
275.0	1.538%11	0.1860	985.8	2332.7	1.626.5	1.4342	87.864	10.923	1.214	0.000	0.000	0.000
280.0	1.348%11	0.1631	986.0	2371.0	1.683.9	1.4080	86.329	12.303	1.367	0.000	0.000	0.000
285.0	1.193%11	0.1444	986.2	2409.3	1.741.3	1.3836	84.756	13.720	1.524	0.000	0.000	0.000
290.0	1.067%11	0.1290	986.3	2447.6	1.798.7	1.3607	83.125	15.188	1.688	0.000	0.000	0.000
295.0	9.629%10	0.1165	986.4	2485.8	1.856.2	1.3392	81.420	16.722	1.858	0.000	0.000	0.000
300.0	8.774%10	0.1061	986.5	2524.1	1.913.6	1.3191	79.628	18.335	2.037	0.000	0.000	0.000
305.0	8.067%10	0.0976	986.6	2562.4	1.971.0	1.3000	77.745	20.029	2.225	0.000	0.000	0.000
310.0	7.481%10	0.0905	986.7	2600.7	2028.4	1.2821	75.777	21.801	2.422	0.000	0.000	0.000
315.0	6.991%10	0.0846	986.7	2639.0	2085.9	1.2652	73.739	23.635	2.626	0.000	0.000	0.000
320.0	6.582%10	0.0796	986.8	2677.2	2143.3	1.2491	71.655	25.511	2.835	0.000	0.000	0.000
325.0	6.238%10	0.0755	986.8	2715.5	2200.7	1.2339	69.549	27.406	3.045	0.000	0.000	0.000
330.0	5.948%10	0.0719	986.9	2753.8	2258.1	1.2195	67.443	29.301	3.256	0.000	0.000	0.000

WE PUT B1= 3.0 TO GET HST

INPUT: LATI= -51.7 LUNGI= 302.2 R=100 MNTH= 6 HUR= 8.2

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8 XHI= 90.0
 DTP= -48.0 MGDP= -46.8 MAGLA= -29.1 SUN DEC.= 23.1
 SUNRISE: 8.2 LT. SUNSET: 15.8 L.T.
 NMF2=3.95%11 NHFI= 0.00%-01 HME=4.27%10 NM0=4.00%08
 HMF2=323.7 HMFI= 0.0 HME=107.5 HMD= 84.5

			RDN+	RDIH+	RDO2+	RDN0+
H	NE	N/IMAX	TN	TE	TI	TE/TI
80.0	2.824%08	7.1%-4	-1	-1	-1	-1
85.0	4.099%08	0.0010	-1	-1	-1	-1
90.0	1.817%09	0.0046	-1	-1	-1	-1
95.0	1.279%10	0.0324	-1	-1	-1	-1
100.0	3.230%10	0.0817	-1	-1	-1	-1
105.0	4.221%10	0.1068	-1	-1	-1	-1
110.0	4.126%10	0.1044	-1	-1	-1	-1
115.0	3.382%10	0.0856	-1	-1	-1	-1
120.0	2.676%10	0.0677	323.4	323.4	323.4	1.0000
125.0	2.368%10	0.0599	377.0	389.9	377.0	1.0343
130.0	2.485%10	0.0629	429.2	455.1	429.2	1.0603
135.0	2.875%10	0.0727	479.2	518.0	479.2	1.0810
140.0	3.355%10	0.0849	525.2	577.0	525.2	1.0986
145.0	4.507%10	0.1140	602.6	680.3	602.6	1.1289
150.0	5.064%10	0.1281	661.8	765.4	661.8	1.1565
155.0	5.723%10	0.1448	706.9	836.3	706.9	1.1831
160.0	6.519%10	0.1650	741.9	897.2	741.9	1.2094
165.0	7.513%10	0.1901	769.6	950.8	769.6	1.2355
170.0	8.233%10	0.2233	792.0	993.1	792.0	1.2615
175.0	1.079%11	0.2730	810.4	1043.4	810.4	1.2875
180.0	1.413%11	0.3576	825.5	1084.4	825.5	1.3136
185.0	1.791%11	0.4532	838.0	1122.8	838.5	1.3391
190.0	2.185%11	0.5528	848.5	1159.1	851.2	1.3617
195.0	2.933%11	0.7423	864.4	1226.8	876.8	1.3992
200.0	3.510%11	0.8882	875.4	1289.6	902.4	1.4292
205.0	3.841%11	0.9721	883.2	1349.2	927.9	1.4540
210.0	4.236%11	0.9190	888.6	1406.4	953.5	1.4750
215.0	3.950%11	0.9901	892.5	1462.1	979.1	1.4933
220.0	3.913%11	0.9530	895.4	1503.7	1004.7	1.4966
225.0	3.766%11	0.9336	897.4	1532.3	1030.5	1.4869
230.0	3.531%11	0.9190	899.0	1561.1	1056.6	1.4775
235.0	3.236%11	0.9190	1083.4	1660.4	1053.4	1.4591
240.0	2.910%11	0.7365	900.1	1580.8	1111.1	1.4405
245.0	2.579%11	0.6526	901.0	1600.6	1139.9	1.4216
250.0	2.261%11	0.5722	901.7	1620.5	1169.3	1.4029
255.0	1.970%11	0.4985	902.3	1640.4	1199.1	1.3847
260.0	1.711%11	0.4331	902.7	1660.4	1229.0	1.3673
265.0	1.487%11	0.3763	903.9	1680.3	1111.1	1.4405
270.0	1.296%11	0.3280	903.3	1700.3	1258.9	1.3506
275.0	1.135%11	0.2873	903.5	1720.3	1288.9	1.3347
280.0	1.001%11	0.2533	903.7	1740.2	1318.8	1.3195
285.0	1.711%11	0.2251	903.9	1760.2	1348.8	1.3050
290.0	8.895%10	0.2017	904.3	1780.2	1378.8	1.2912
295.0	7.969%10	0.1822	904.0	1800.2	1408.7	1.2779
300.0	7.201%10	0.1321	904.1	1900.4	1438.7	1.2651
305.0	4.909%10	0.1242	904.2	1820.2	1468.7	1.2529
310.0	6.563%10	0.1176	904.5	1840.1	1498.7	1.2412
315.0	4.648%10	0.1120	904.5	1940.0	1618.5	1.1986
320.0	4.428%10	0.1073	904.5	1960.0	1648.5	1.1890
325.0	4.241%10	0.1073	904.5	1960.0	1648.5	1.1890

WE FUT 61= 3.0TH GET LIST

INPUT: LATI= -51.7 LONGI= 302.2 P=100 HUNTH= 6 HICUR= 0.0

CALCULATED VALUES: NLAT= -40.5 MLNG= 9.8

DIP= -48.0 MULP= -46.8 MAGLA= -29.1 XHI= 151.4

SUNRISE: 8.2 L.T. SUNSET: 15.8 L.T. SUN DEC.= 23.1

NMF2=1.29% HNF1= 0.00% NME=3.20%09 NMG=4.00%08

HMF2=319.8 HNF1= 0.0 HME=105.0 HMD= 88.0

H	NE	TN	TE	TI	TE/TI	RDD+	RDH*	RDHE+	RDO2+	RDND+
80.0	4.901%05	3.8% -6	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.453%08	0.901%9	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.720%08	0.0037	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.503%09	0.0194	-1	-1	-1	-1	-1	-1	-1	-1
100.0	3.193%09	0.0248	-1	-1	-1	0.003	0.000	0.000	0.000	17.568
105.0	3.201%09	0.0248	-1	-1	-1	0.006	0.000	0.000	0.000	82.429
110.0	2.613%09	0.02203	-1	-1	-1	0.012	0.000	0.000	0.000	79.595
115.0	1.700%09	0.0132	-1	-1	-1	0.023	0.000	0.000	0.000	76.313
120.0	1.080%09	0.0084	318.2	318.2	1.0000	0.044	0.000	0.000	0.000	72.535
125.0	7.594%08	0.0059	369.8	374.2	369.8	0.0117	0.084	0.000	0.000	68.258
130.0	6.276%08	0.0049	420.1	428.8	420.1	0.0206	0.161	0.000	0.000	63.621
135.0	6.167%08	0.0048	467.9	481.0	467.9	0.0278	0.307	0.000	0.000	59.123
140.0	7.027%08	0.0055	511.7	529.0	511.7	0.0339	0.584	0.000	0.000	55.754
150.0	1.168%09	0.0091	584.3	610.4	584.3	1.0445	2.075	0.000	0.000	54.416
160.0	1.948%09	0.0151	638.9	673.6	638.9	1.0543	6.912	0.000	0.000	56.044
170.0	3.007%09	0.0233	679.9	723.3	679.9	1.0638	19.672	0.000	0.000	56.457
180.0	7.632%09	0.0592	711.4	763.5	711.4	1.0732	41.907	0.000	0.000	49.625
190.0	1.428%10	0.1108	736.3	797.0	736.3	1.0825	63.821	0.000	0.000	21.641
200.0	2.229%10	0.1730	756.2	825.6	756.2	1.0918	77.705	0.000	0.000	25.620
210.0	3.194%10	0.2479	772.5	850.6	772.5	1.1011	83.329	0.000	0.000	18.857
220.0	4.345%10	0.3373	785.9	872.6	785.9	1.1104	86.537	0.000	0.000	15.125
230.0	5.635%10	0.4374	797.0	892.4	797.0	1.1197	88.599	0.000	0.000	12.890
240.0	6.994%10	0.5429	806.2	910.3	806.4	1.1280	90.000	0.000	0.000	11.188
250.0	9.591%10	0.7444	820.2	941.7	825.0	1.1414	93.390	0.000	0.000	9.641
260.0	1.155%11	0.8967	830.0	968.8	843.6	1.1484	96.417	0.000	0.000	6.599
270.0	1.261%11	0.9787	836.8	992.9	862.2	1.1517	98.000	0.000	0.000	3.582
280.0	1.288%11	1.00000	841.6	1015.1	880.7	1.1526	98.071	0.628	0.070	2.000
290.0	1.273%11	0.9881	845.0	1035.9	899.2	1.1520	98.030	1.621	0.180	0.000
300.0	1.230%11	0.9546	847.5	1055.7	917.4	1.1508	97.955	1.810	0.201	0.000
310.0	1.164%11	0.9037	849.3	1074.9	935.1	1.1495	97.860	1.923	0.214	0.000
320.0	1.083%11	0.8404	850.7	1093.6	951.4	1.1495	97.304	2.426	0.270	0.000
330.0	9.921%10	0.7701	851.7	1093.6	964.9	1.1334	93.968	5.429	0.603	0.000
340.0	8.988%10	0.6976	852.5	1093.6	974.2	1.1226	89.573	9.384	1.043	0.000
350.0	8.075%10	0.6268	853.1	1093.6	979.3	1.1168	85.227	13.296	1.477	0.000
360.0	7.220%10	0.5604	853.6	1093.6	981.6	1.1142	80.930	17.163	1.907	0.000
370.0	6.440%10	0.4999	854.0	1093.6	982.5	1.1131	76.642	21.022	2.336	0.000
380.0	5.747%10	0.4461	854.3	1093.7	982.9	1.1127	72.323	24.909	2.768	0.000
390.0	5.461%10	0.3990	855.1	1093.7	983.2	1.1124	45.050	44.955	4.995	0.000
400.0	5.140%10	0.3293	855.2	1093.7	983.2	1.1124	45.748	48.827	5.425	0.000
410.0	4.616%10	0.3583	855.3	1093.7	983.2	1.1124	41.648	52.517	3.651	0.000
420.0	4.168%10	0.3235	855.4	1093.7	983.1	1.1125	58.994	36.905	4.101	0.000
430.0	3.785%10	0.2938	855.0	1093.7	983.1	1.1125	54.490	40.959	4.551	0.000
440.0	3.461%10	0.2686	855.1	1093.7	983.2	1.1124	45.050	44.955	4.995	0.000
450.0	3.186%10	0.2473	855.2	1093.7	983.2	1.1124	45.748	48.827	5.425	0.000
460.0	2.954%10	0.2293	855.3	1093.7	983.2	1.1124	41.648	52.517	3.651	0.000
470.0	2.727%10	0.1806	855.5	1093.8	983.3	1.1124	37.797	55.982	6.220	0.000
480.0	2.525%10	0.1727	855.5	1093.8	983.3	1.1124	34.223	59.199	6.578	0.000
490.0	2.327%10	0.1601	855.6	1093.8	983.3	1.1124	30.934	62.159	6.907	0.000
500.0	2.137%10	0.1659	855.6	1093.8	983.3	1.1124	27.929	64.864	7.207	0.000
510.0	2.062%10	0.1601	855.6	1093.8	983.3	1.1124	25.194	67.325	7.481	0.000
520.0	2.000	0.1601	855.6	1093.8	983.3	1.1124	22.714	69.557	7.729	0.000
530.0	1.948%10	0.1900	855.5	1093.8	983.2	1.1124	20.471	71.576	7.953	0.000

WE PUT RL= 3.0T GET 1ST

INPUT: LATI= -51.7 LONGI= 302.2 R=100 MONTH=12 HHTUR=12.0

CALCULATED VALUES: MLAT= -40.5 MAGLA= -29.1 XHI= 28.8
 DIP= -48.0 MDIP= -46.8 SUNSET:20.2 L.T. SUN DEC.= -22.9
 SUNRISE: 3.8 L.T. NME=1.64%11 NMD=1.29%09
 NMF2=1.14%12 HMFL= 3.51%11 HME=1.29%09
 HMFD=351.4 HMFL=278.6 HME=110.0 HMD= 81.0

H	NE	N/NMAX	TN	TE	T1	TE/T1	RDD+	RDH+	RDD2+	RDNH+	RDN+
80.0	1.229%09	0.0011	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.587%09	0.0023	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	2.489%10	0.0218	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	8.373%10	0.0733	-1	-1	-1	-1	0.336	0.000	0.000	52.683	46.980
100.0	1.399%11	0.1225	-1	-1	-1	-1	0.482	0.000	0.000	48.029	51.489
105.0	1.614%11	0.1413	-1	-1	-1	-1	0.691	0.000	0.000	43.870	55.440
110.0	1.635%11	0.1432	-1	-1	-1	-1	0.989	0.000	0.000	40.249	58.762
115.0	1.593%11	0.1394	-1	-1	-1	-1	1.415	0.000	0.000	37.244	61.341
120.0	1.569%11	0.1373	338.6	338.6	1.0000	1.0000	2.024	0.000	0.000	34.870	63.106
125.0	1.635%11	0.1431	398.1	417.2	398.1	1.0480	2.887	0.000	0.000	32.992	64.120
130.0	1.651%11	0.1445	456.1	494.3	456.1	1.0838	4.107	0.000	0.000	31.415	64.479
135.0	1.658%11	0.1452	512.2	569.6	512.2	1.120	5.809	0.000	0.000	30.000	64.191
140.0	1.666%11	0.1459	564.9	641.4	564.9	1.1354	11.251	0.000	0.000	27.434	61.315
145.0	1.683%11	0.1474	657.0	771.7	657.0	1.1746	19.962	0.000	0.000	25.085	54.954
150.0	1.703%11	0.1490	731.1	884.1	731.1	1.2092	30.669	0.000	0.000	22.784	46.547
155.0	1.724%11	0.1509	790.0	981.2	790.0	1.2420	40.806	0.000	0.000	19.744	39.450
160.0	1.749%11	0.1531	837.2	1066.7	837.2	1.2740	49.733	0.000	0.000	13.584	36.633
165.0	1.776%11	0.1555	875.5	1143.2	875.5	1.3057	58.351	0.000	0.000	6.033	35.616
170.0	1.808%11	0.1583	907.0	1212.9	907.0	1.3372	67.504	0.000	0.000	2.127	30.369
175.0	1.845%11	0.1615	933.0	1277.1	933.0	1.3688	77.593	0.000	0.000	0.716	21.691
180.0	1.889%11	0.1654	954.7	1337.1	954.7	1.4005	88.069	0.000	0.000	0.239	11.691
185.0	1.943%11	0.1701	972.8	1393.4	972.8	1.4324	95.635	0.000	0.000	0.080	4.285
190.0	1.776%11	0.1555	987.9	1446.7	987.9	1.4645	98.527	0.000	0.000	0.009	1.464
195.0	2.012%11	0.1761	1011.0	1546.2	1011.0	1.5282	98.595	0.000	0.000	0.001	1.404
200.0	2.282%11	0.1997	1027.1	1638.8	1034.6	1.5840	98.596	0.000	0.000	0.000	0.616
205.0	3.778%11	0.3307	1038.4	1726.6	1057.4	1.6329	98.596	0.000	0.000	0.000	0.000
210.0	7.097%11	0.6213	1046.3	1811.0	1080.3	1.6765	98.596	1.202	0.134	0.000	0.008
215.0	9.927%11	0.8690	1046.3	1893.2	1103.3	1.7160	98.594	1.258	0.140	0.000	0.000
220.0	9.251%11	0.88690	1046.3	1952.0	1126.7	1.7326	98.593	1.266	0.141	0.000	0.001
225.0	1.127%12	0.9867	1052.0	1056.2	1151.3	1.7287	98.590	1.269	0.141	0.000	0.000
230.0	1.138%12	0.9964	1056.2	1990.3	1059.2	1.7329	98.586	1.272	0.141	0.000	0.000
235.0	1.098%12	0.9616	1061.4	2029.2	1178.7	1.7216	98.578	1.280	0.142	0.000	0.000
240.0	1.024%12	0.8961	1061.4	2068.6	1211.6	1.7074	98.454	1.258	0.140	0.000	0.000
245.0	8.152%11	0.9099	1063.1	1893.2	1103.3	1.7160	98.454	1.258	0.140	0.000	0.000
250.0	7.043%11	0.7136	1064.5	2108.2	1252.9	1.6826	97.398	2.342	0.260	0.000	0.000
255.0	6.001%11	0.6165	1065.5	2148.0	1302.7	1.6488	97.879	3.709	0.412	0.000	0.000
260.0	5.069%11	0.5253	1066.2	2187.9	1358.2	1.6109	94.357	5.079	0.564	0.000	0.000
265.0	4.267%11	0.4438	1066.9	2227.8	1416.3	1.5730	94.357	5.079	0.564	0.000	0.000
270.0	3.595%11	0.3736	1067.4	2267.8	1475.6	1.5369	92.846	6.438	0.715	0.000	0.000
275.0	2.911%11	0.3147	1067.8	2307.7	1535.3	1.5031	91.342	7.793	0.866	0.000	0.000
280.0	2.041%11	0.2662	1068.4	2347.7	1595.1	1.4718	89.836	9.148	1.016	0.000	0.000
285.0	2.590%11	0.2267	1069.2	2387.7	1655.1	1.4426	88.318	10.514	1.168	0.000	0.000
290.0	2.225%11	0.1948	1068.6	2427.6	1715.0	1.4155	86.776	11.902	1.322	0.000	0.000
295.0	1.931%11	0.1690	1068.8	2467.6	1775.0	1.3902	85.194	13.326	1.481	0.000	0.000
300.0	1.694%11	0.1483	1069.4	2507.6	1834.9	1.3666	83.554	14.801	1.645	0.000	0.000
305.0	1.503%11	0.1315	1069.1	2547.6	1894.9	1.3444	81.841	16.344	1.816	0.000	0.000
310.0	1.348%11	0.1180	1069.2	2587.6	1954.9	1.3236	80.040	17.964	1.996	0.000	0.000
315.0	1.222%11	0.0979	1069.3	2627.5	2014.8	1.3041	78.147	19.668	2.185	0.000	0.000
320.0	1.119%11	0.0979	1069.4	2667.5	2074.8	1.2857	76.169	21.448	2.383	0.000	0.000
325.0	1.034%11	0.0905	1069.4	2707.5	2134.8	1.2683	74.121	23.292	2.588	0.000	0.000
330.0	9.642%10	0.0844	1069.5	2747.5	2194.7	1.2518	72.025	24.177	2.797	0.000	0.000
335.0	9.064%10	0.0793	1069.6	2787.4	2254.7	1.2363	69.908	25.083	3.009	0.000	0.000
340.0	8.583%10	0.0751	1069.6	2827.4	2314.7	1.2215	67.792	28.987	3.221	0.000	0.000

WE PUT B1= 3.0TO GET HST

INPUT: LATI= -51.7 LONGI= 302.2 R=100 MONTH=12 HOUR= 3.8

CALCULATED VALUES: MLAT= -40.5 MLNG= 9.8
 DIP= -48.0 MODIP= -46.8 MAGLA= -29.1 XHI= 90.0
 SUNRISE: 3.8 L.T. SUNSET:20.2 L.T. SUN DEC. = -22.9
 NMF1= 0.00% -01 NME=3.80%10 NMD=4.00%08
 HMF2=355.5 HMF1= 0.0 HME=107.5 HMD= 84.5

H	NE	N/NMAX	TN	TE	TI	TE/TI	RDI+	RDH*	RDHE+	RDO+	RDN+
80.0	2.826%08	3.4%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	4.100%08	5.0%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	1.818%09	0.0022	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	1.234%10	0.0149	-1	-1	-1	-1	-1	-1	-1	-1	-1
100.0	2.964%10	0.0358	-1	-1	-1	-1	-1	-1	-1	-1	-1
105.0	3.764%10	0.0455	-1	-1	-1	-1	-1	-1	-1	-1	-1
110.0	3.677%10	0.0445	-1	-1	-1	-1	-1	-1	-1	-1	-1
115.0	3.047%10	0.0368	-1	-1	-1	-1	-1	-1	-1	-1	-1
120.0	2.449%10	0.0296	326.5	326.5	1.0000	0.101	0.000	0.000	0.000	6.623	93.361
125.0	2.187%10	0.0264	381.2	393.7	381.2	1.0326	0.159	0.000	0.000	8.541	91.434
130.0	2.288%10	0.0277	434.7	459.5	434.7	1.0572	0.252	0.000	0.000	10.994	88.966
135.0	2.621%10	0.0317	485.8	523.2	485.8	1.0768	0.397	0.000	0.000	14.085	85.852
140.0	3.032%10	0.0366	533.2	582.9	533.2	1.0933	0.623	0.000	0.000	17.829	82.070
150.0	3.928%10	0.0475	613.5	688.1	613.5	1.1216	1.498	0.000	0.000	21.966	77.875
160.0	4.289%10	0.0518	675.5	775.0	675.5	1.1473	3.368	0.000	0.000	31.531	65.101
170.0	4.695%10	0.0568	723.2	847.5	723.2	1.1720	6.679	0.000	0.000	31.688	61.633
180.0	5.154%10	0.0623	760.3	909.6	760.3	1.1963	11.436	0.000	0.000	30.852	57.710
190.0	5.676%10	0.0686	790.0	964.1	790.0	1.2204	17.669	0.000	0.000	25.763	56.569
200.0	6.275%10	0.0759	813.9	1012.9	813.9	1.2445	26.008	0.000	0.000	16.079	57.913
210.0	6.971%10	0.0843	833.6	1057.5	833.6	1.2686	37.565	0.000	0.000	8.607	53.827
220.0	7.794%10	0.0942	849.9	1098.6	849.9	1.2927	53.681	0.000	0.000	4.466	41.853
230.0	8.786%10	0.1062	863.4	1137.0	863.4	1.3169	74.390	0.000	0.000	2.307	23.303
240.0	1.003%11	0.1212	874.6	1173.1	875.0	1.3406	92.014	0.000	0.000	1.191	6.796
260.0	1.413%11	0.1708	891.7	1240.0	898.1	1.3807	99.365	0.000	0.000	0.317	0.317
280.0	2.981%11	0.3603	903.7	1301.7	921.2	1.4130	99.541	0.000	0.000	0.084	0.084
300.0	5.201%11	0.6287	912.0	1359.7	944.2	1.4400	99.544	0.063	0.007	0.023	0.364
320.0	7.096%11	0.8578	917.9	1415.4	967.3	1.4632	99.543	0.035	0.006	0.097	0.097
340.0	8.092%11	0.9782	922.1	1469.3	990.4	1.4835	99.542	0.0387	0.043	0.043	0.043
360.0	8.265%11	0.9991	925.1	1508.9	1013.6	1.4886	99.541	0.0407	0.045	0.045	0.045
380.0	8.050%11	0.9731	927.4	1535.1	1037.0	1.4803	99.538	0.0414	0.046	0.046	0.046
400.0	7.580%11	0.9163	929.0	1561.5	1061.0	1.4718	99.534	0.0419	0.047	0.047	0.047
420.0	6.927%11	0.8374	930.3	1581.2	1085.9	1.4561	99.526	0.0427	0.047	0.047	0.047
440.0	6.174%11	0.7463	931.3	1601.1	1112.5	1.4392	99.401	0.0539	0.060	0.000	0.000
460.0	5.395%11	0.6522	932.0	1621.0	1140.6	1.4212	98.334	1.499	0.167	0.000	0.000
480.0	4.648%11	0.5619	932.6	1640.9	1169.7	1.4028	96.800	2.880	0.320	0.000	0.000
500.0	3.969%11	0.4798	933.0	1660.9	1199.4	1.3848	95.264	4.262	0.474	0.000	0.000
520.0	3.375%11	0.4079	933.4	1680.9	1229.2	1.3674	93.739	5.635	0.626	0.000	0.000
540.0	2.869%11	0.3468	933.7	1700.9	1259.2	1.3508	92.220	7.002	0.778	0.000	0.000
560.0	2.448%11	0.2959	934.0	1720.9	1289.2	1.3349	90.699	8.371	0.930	0.000	0.000
580.0	2.101%11	0.2540	934.2	1740.9	1319.2	1.3197	89.167	9.750	1.083	0.000	0.000
600.0	1.818%11	0.2198	934.8	1760.9	1349.2	1.3051	87.610	11.151	1.239	0.000	0.000
620.0	1.588%11	0.1920	934.5	1780.9	1379.2	1.2913	86.013	12.588	1.399	0.000	0.000
640.0	1.402%11	0.1694	934.6	1800.9	1409.2	1.2780	84.358	14.078	1.564	0.000	0.000
660.0	1.250%11	0.1511	934.7	1820.9	1439.2	1.2652	82.627	15.635	1.737	0.000	0.000
680.0	1.126%11	0.1361	934.8	1840.9	1469.2	1.2530	80.809	17.272	1.919	0.000	0.000
700.0	1.025%11	0.1239	934.8	1860.9	1499.2	1.2413	78.898	18.992	2.110	0.000	0.000
720.0	9.423%10	0.1139	934.9	1880.9	1529.2	1.2300	1.2300	20.789	2.310	0.000	0.000
740.0	8.741%10	0.1057	934.9	1900.9	1559.2	1.2192	74.833	22.650	2.517	0.000	0.000
760.0	8.176%10	0.0988	935.0	1920.9	1589.2	1.2087	72.718	24.554	2.728	0.000	0.000
780.0	7.706%10	0.0932	935.0	1940.9	1619.2	1.1987	70.580	26.478	2.942	0.000	0.000
800.0	7.315%10	0.0884	935.1	1960.9	1649.2	1.1890	68.443	28.401	3.156	0.000	0.000

WE PUT H1= 3.0 TD GET HST

INPUT: LATI= -51.7 LONGI= 362.2 R=100 MONTH=12 HOUR= 0.0

CALCULATED VALUES: MLAT= -40.5 MLLNG= 9.8
 DIP= +48.0 MODIP= -46.8 MAGLA= -29.1 XHI= 105.4
 SUNRISE: 3.8 L.T. SUNSET: 20.2 L.T. SUN DEC.= +22.9
 NMF2=9.12%11 NMFI= 0.00%-01 NME=3.20%09 NMD=4.00%08
 HMF2=345.9 HMFI= 0.0 HME=105.1 HMD= 87.9

			TE/TI	TI	TE	TN	TE	TI	TE/TI	RDH+	RDH+	RD02+	RD02+	RDNO+	RDNO+
H	NE	N/HMAX	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
80.0	1.387%06	1.5%-6	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
85.0	2.677%08	2.9%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
90.0	4.828%08	5.3%-4	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
95.0	2.558%09	0.0028	-1	-1	-1	-1	-1	-1	-1	0.016	0.000	0.000	6.623	93.361	93.361
100.0	3.194%09	0.0035	-1	-1	-1	-1	-1	-1	-1	0.025	0.000	0.000	8.541	91.434	91.434
105.0	3.201%09	0.0029	-1	-1	-1	-1	-1	-1	-1	0.040	0.000	0.000	10.994	88.966	88.966
110.0	2.645%09	0.0019	-1	-1	-1	-1	-1	-1	-1	0.064	0.000	0.000	14.085	85.852	85.852
115.0	1.747%09	0.0019	-1	-1	-1	-1	-1	-1	-1	0.000	0.000	0.000	17.829	82.070	82.070
120.0	1.128%09	0.0012	325.8	325.8	325.8	325.8	325.8	325.8	325.8	1.0000	0.000	0.000	21.966	77.875	77.875
125.0	8.063%08	8.8%-4	380.3	383.7	380.3	380.3	380.3	383.7	380.3	1.0090	0.160	0.000	25.782	73.966	73.966
130.0	6.759%08	7.4%-4	440.3	433.4	440.3	433.4	440.3	433.4	433.4	1.0157	0.252	0.000	28.494	71.109	71.109
135.0	6.708%08	7.4%-4	484.4	494.6	484.4	494.6	484.4	494.6	484.4	1.0211	0.397	0.000	30.000	69.377	69.377
140.0	7.673%08	8.4%-4	531.4	545.0	531.4	545.0	531.4	545.0	531.4	1.0256	0.623	0.000	31.125	67.376	67.376
145.0	1.261%09	0.0014	611.0	631.5	611.0	631.5	611.0	631.5	611.0	1.0335	1.499	0.000	31.523	65.108	65.108
150.0	2.048%09	0.0022	672.4	699.7	672.4	699.7	672.4	699.7	672.4	1.0405	3.369	0.000	31.631	61.688	61.688
160.0	3.174%09	0.0035	719.5	753.6	719.5	753.6	719.5	753.6	719.5	1.0474	6.682	0.000	30.463	58.096	58.096
170.0	4.120%10	0.0060	756.2	797.1	756.2	797.1	756.2	797.1	756.2	1.0541	11.440	0.000	24.037	58.288	58.288
180.0	5.457%09	0.0060	833.1	875.4	833.1	875.4	833.1	875.4	833.1	1.0607	17.675	0.000	12.998	60.985	60.985
190.0	8.981%09	0.0098	785.4	833.1	785.4	833.1	785.4	833.1	809.0	1.0674	26.016	0.000	31.523	56.664	56.664
200.0	1.482%10	0.0162	809.0	863.5	809.0	863.5	809.0	863.5	828.4	1.0740	37.577	0.000	5.759	43.855	43.855
210.0	2.459%10	0.0270	828.4	889.7	828.4	889.7	828.4	889.7	897.9	1.0807	53.695	0.000	2.450	24.556	24.556
220.0	4.120%10	0.0451	844.4	912.5	844.4	912.5	844.4	912.5	844.4	1.0874	74.407	0.000	1.036	7.533	7.533
230.0	7.023%10	0.0770	857.6	932.6	857.6	932.6	857.6	932.6	857.6	1.0941	92.029	0.000	0.438	0.667	0.667
240.0	1.206%11	0.1322	868.7	950.4	868.7	950.4	868.7	950.4	885.5	1.0777	99.254	0.000	0.078	0.151	0.151
250.0	2.841%11	0.3113	885.5	980.9	885.5	980.9	885.5	980.9	980.9	1.1077	97.970	1.187	0.014	0.002	0.002
260.0	5.062%11	0.5548	897.3	1006.3	897.3	1006.3	897.3	1006.3	909.9	1.1207	97.970	1.179	0.000	0.005	0.005
280.0	8.658%11	0.9451	905.5	1028.1	905.5	1028.1	905.5	1028.1	909.9	1.1300	95.560	3.969	0.441	0.000	0.000
300.0	7.195%11	0.7885	905.5	1047.5	905.5	1047.5	905.5	1047.5	921.8	1.1364	93.146	6.164	0.685	0.000	0.000
320.0	8.594%11	0.9418	911.2	1047.5	911.2	1047.5	911.2	1047.5	933.7	1.1049	90.774	0.922	0.000	0.000	0.000
340.0	9.104%11	0.9977	915.4	1065.3	915.4	1065.3	915.4	1065.3	945.5	1.1443	88.437	10.406	1.156	0.000	0.000
360.0	9.041%11	0.9908	918.4	1081.9	918.4	1081.9	918.4	1081.9	987.9	1.1727	86.124	12.488	1.388	0.000	0.000
380.0	8.658%11	0.9488	920.6	1097.7	920.6	1097.7	920.6	1097.7	956.9	1.1472	83.819	14.563	1.618	0.000	0.000
400.0	8.027%11	0.8797	922.2	1113.0	922.2	1113.0	922.2	1113.0	967.6	1.1472	81.500	16.650	1.850	0.000	0.000
420.0	7.238%11	0.7932	923.4	1114.7	923.4	1114.7	923.4	1114.7	983.2	1.1337	79.141	18.773	2.086	0.000	0.000
440.0	6.378%11	0.6990	924.4	1114.7	924.4	1114.7	924.4	1114.7	987.4	1.1297	76.705	20.966	2.330	0.000	0.000
460.0	5.523%11	0.6053	925.1	1115.5	925.1	1115.5	925.1	1115.5	995.8	1.1277	74.146	23.268	2.585	0.000	0.000
480.0	4.725%11	0.5179	925.7	1116.3	925.7	1116.3	925.7	1116.3	990.0	1.1277	71.414	25.727	2.859	0.000	0.000
500.0	4.014%11	0.4399	926.1	1117.2	926.1	1117.2	926.1	1117.2	998.4	1.1265	71.414	41.412	4.601	0.000	0.000
520.0	3.401%11	0.37728	926.5	1118.0	926.5	1118.0	926.5	1118.0	993.2	1.1257	68.456	28.389	3.154	0.000	0.000
540.0	2.886%11	0.3163	927.5	1123.1	927.5	1123.1	927.5	1123.1	994.5	1.1250	65.232	31.292	3.477	0.000	0.000
560.0	2.460%11	0.2696	927.0	1120.5	927.0	1120.5	927.0	1120.5	995.8	1.1244	61.723	34.449	3.828	0.000	0.000
580.0	2.111%11	0.2313	927.2	1124.7	927.2	1124.7	927.2	1124.7	997.1	1.1238	57.954	37.842	4.205	0.000	0.000
600.0	1.827%11	0.2002	927.4	1121.4	927.4	1121.4	927.4	1121.4	998.4	1.1232	53.987	41.412	4.601	0.000	0.000
620.0	1.597%11	0.1750	927.5	1122.2	927.5	1122.2	927.5	1122.2	999.6	1.1226	49.913	45.074	5.008	0.000	0.000
640.0	1.410%11	0.1545	927.6	1123.1	927.6	1123.1	927.6	1123.1	1000.9	1.1221	45.857	48.729	5.414	0.000	0.000
660.0	1.258%11	0.1379	927.7	1123.9	927.7	1123.9	927.7	1123.9	1002.2	1.1215	41.900	52.290	5.810	0.000	0.000
680.0	1.135%11	0.1244	927.8	1124.7	927.8	1124.7	927.8	1124.7	1003.4	1.1209	38.126	55.687	6.187	0.000	0.000
700.0	1.034%11	0.1133	927.9	1125.6	927.9	1125.6	927.9	1125.6	1004.7	1.1203	34.584	58.875	6.542	0.000	0.000
720.0	9.506%10	0.1042	928.0	1126.4	928.0	1126.4	928.0	1126.4	1005.9	1.1198	31.301	61.830	6.870	0.000	0.000
740.0	8.821%10	0.0967	928.0	1127.3	928.0	1127.3	928.0	1127.3	1007.2	1.1192	28.283	64.545	7.172	0.000	0.000
760.0	8.254%10	0.0905	928.1	1128.1	928.1	1128.1	928.1	1128.1	1008.5	1.1186	25.529	67.024	7.447	0.000	0.000
780.0	7.782%10	0.0853	928.1	1128.9	928.1	1128.9	928.1	1128.9	1009.7	1.1181	23.026	69.277	7.697	0.000	0.000
800.0	7.388%10	0.0810	928.1	1129.8	928.1	1129.8	928.1	1129.8	1011.0	1.1175	20.757	71.319	7.924	0.000	0.000

WE PUT H1* 3.0TO GET HST

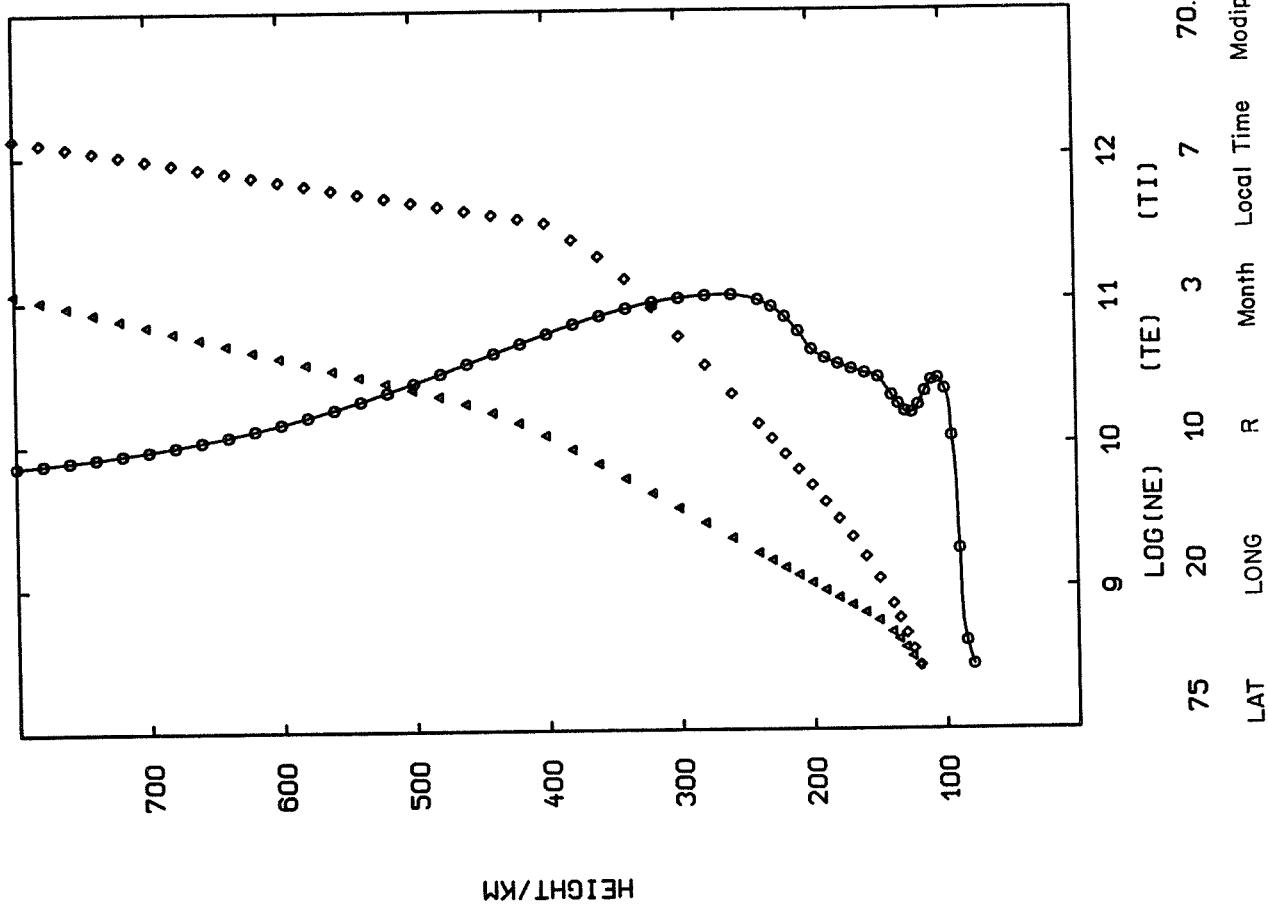
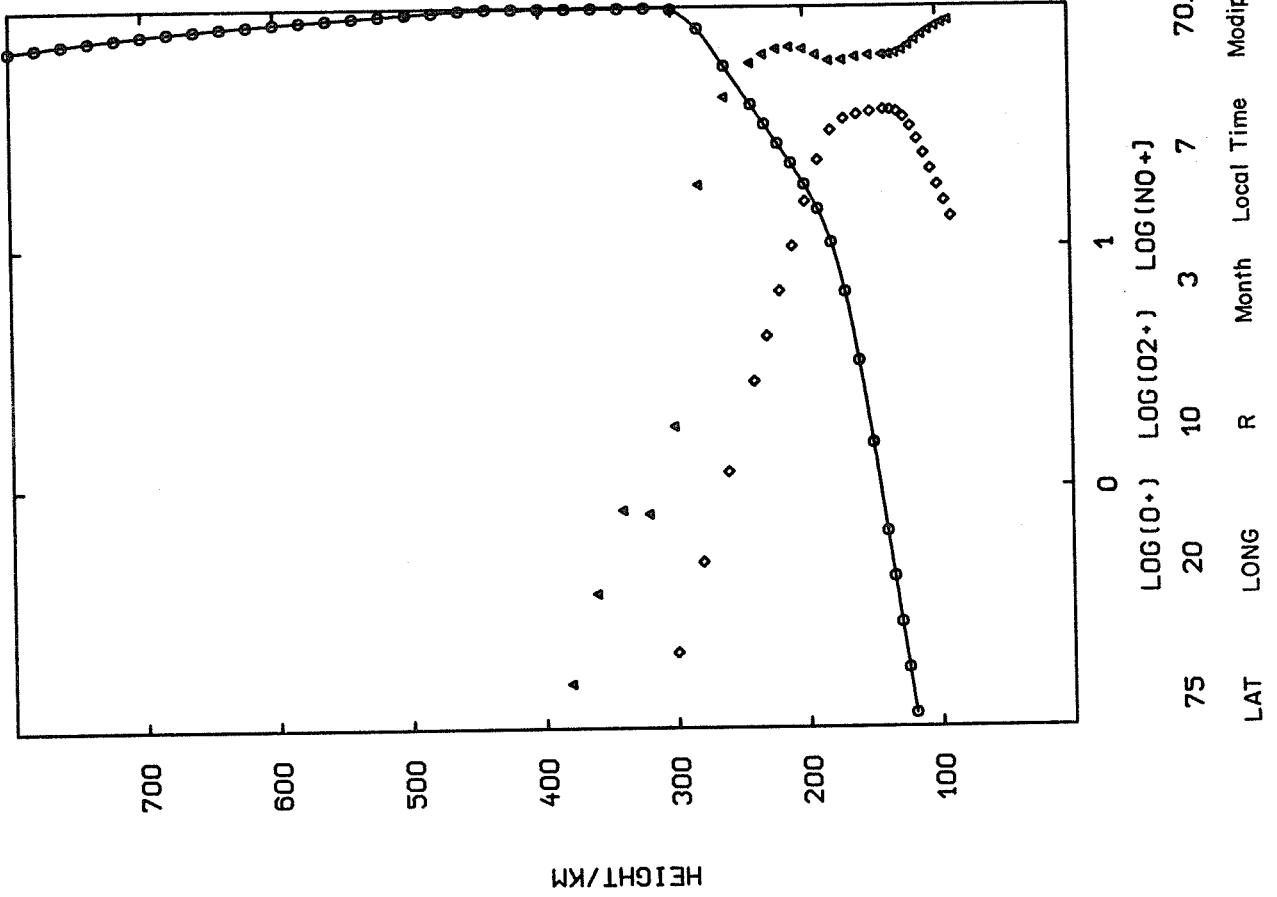
4.2 Figures

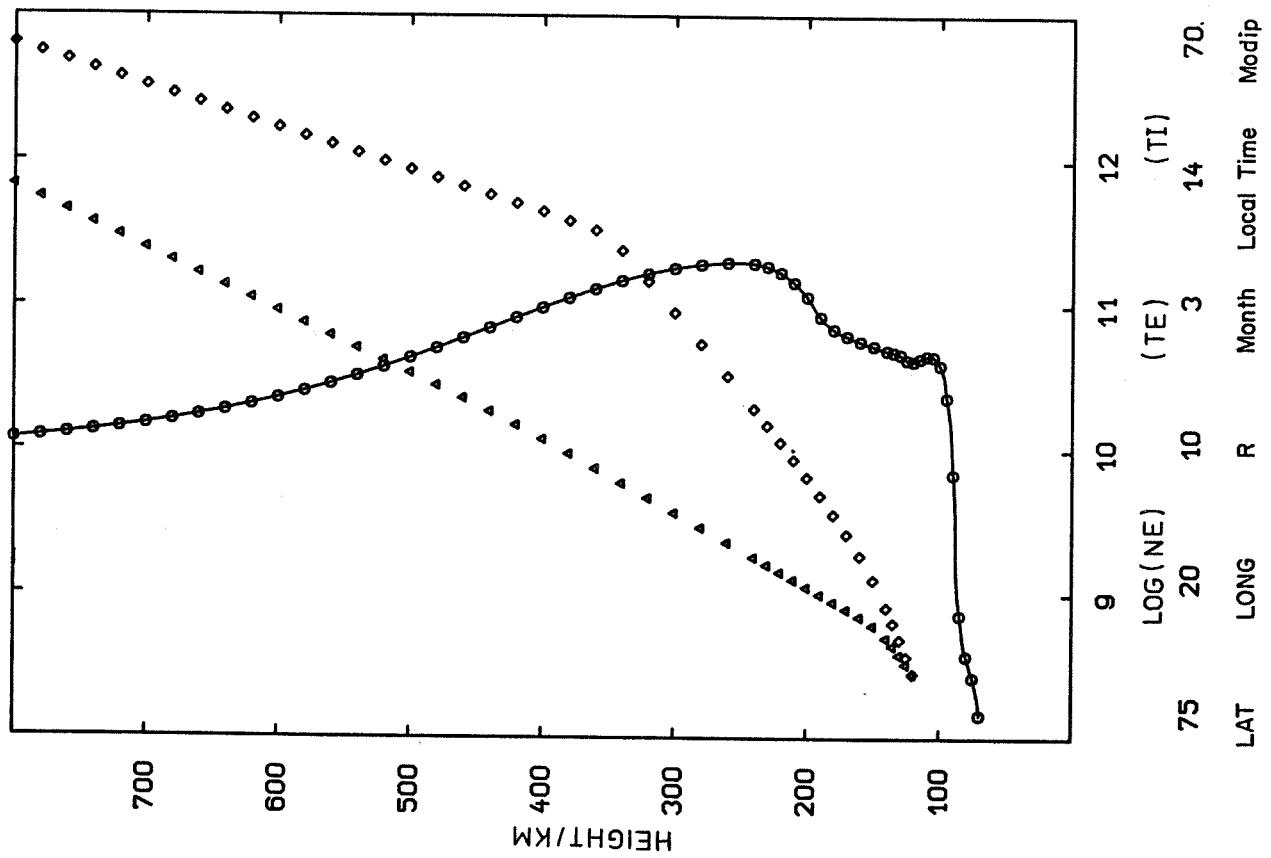
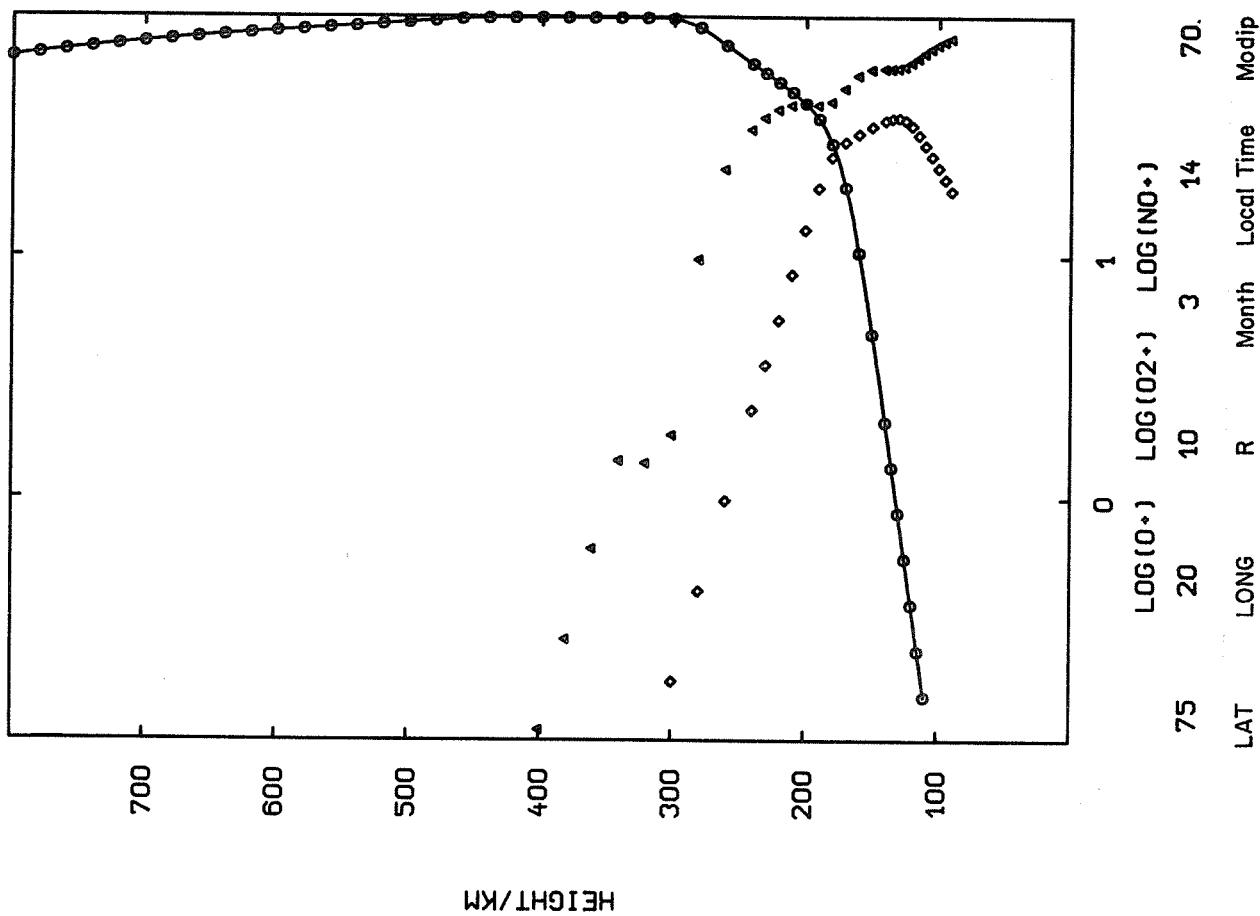
On each of the following 72 pages a pair of figures gives height profiles in the 80 to 800 km range for a total of six output parameters of the programs. Here too the peak values NMF2 and HMF2 were determined by the CCIR-method. The left-hand diagram shows the logarithm of electron density NE/m^3 , the electron temperature $TE(K)$ and ion temperature $TI(K)$ on linear scales. The numerical values given on the abscissa refer to log of electron density NE only (circles). As for the temperatures TE (diamonds) and TI (triangles) the numbers on the abscissa scale correspond to $(8 + 1.5 \frac{1000K}{1000K})$ so that the following identification table holds:

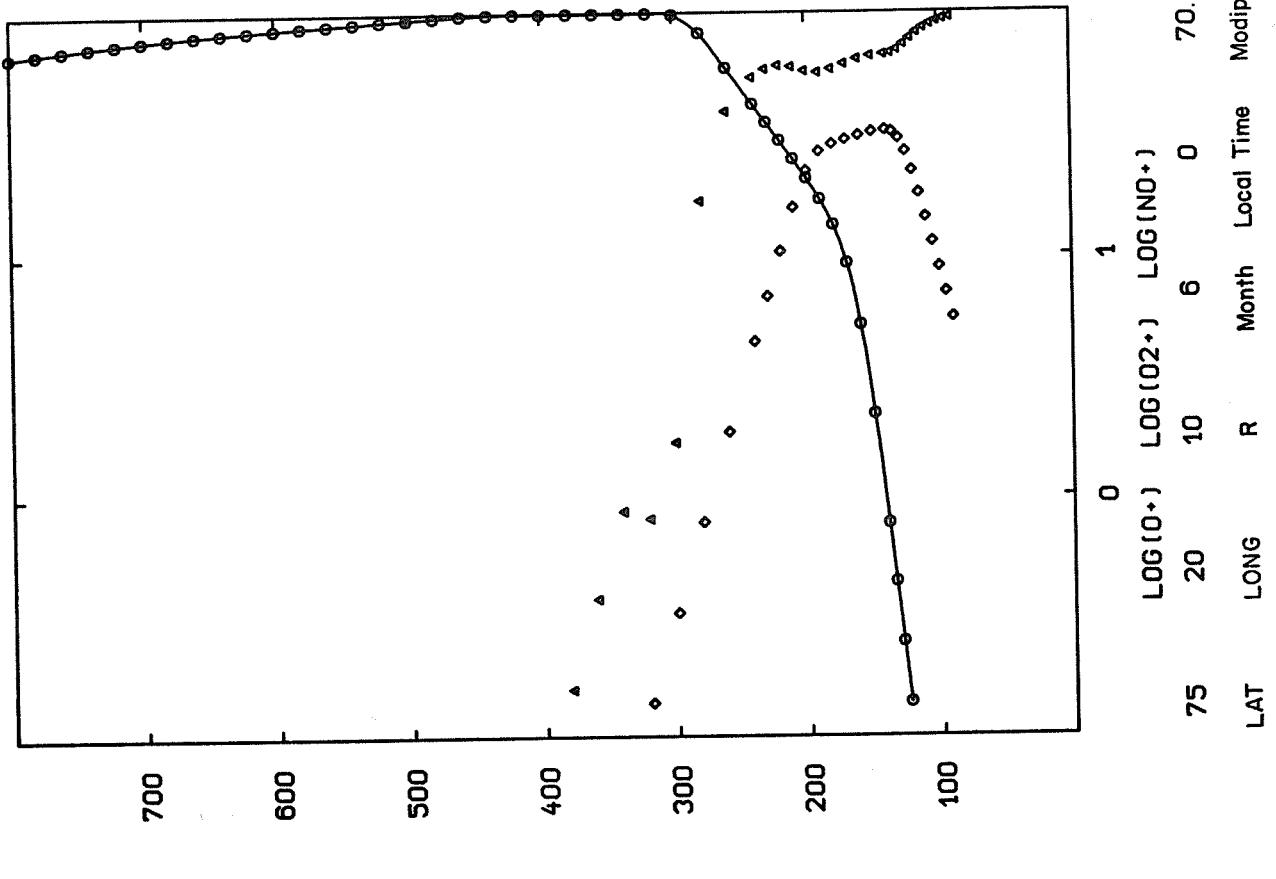
T(K)	300	500	700	1000	1500	2000	2500	3000
value	8.45	8.75	9.05	9.5	10.25	11	11.75	12.5

On the right-hand diagram the logarithms of ion percentage value are shown for O^+ (circles), O_2^+ (diamonds) and N_2^+ (triangles). Light ions are the complement to 100%.

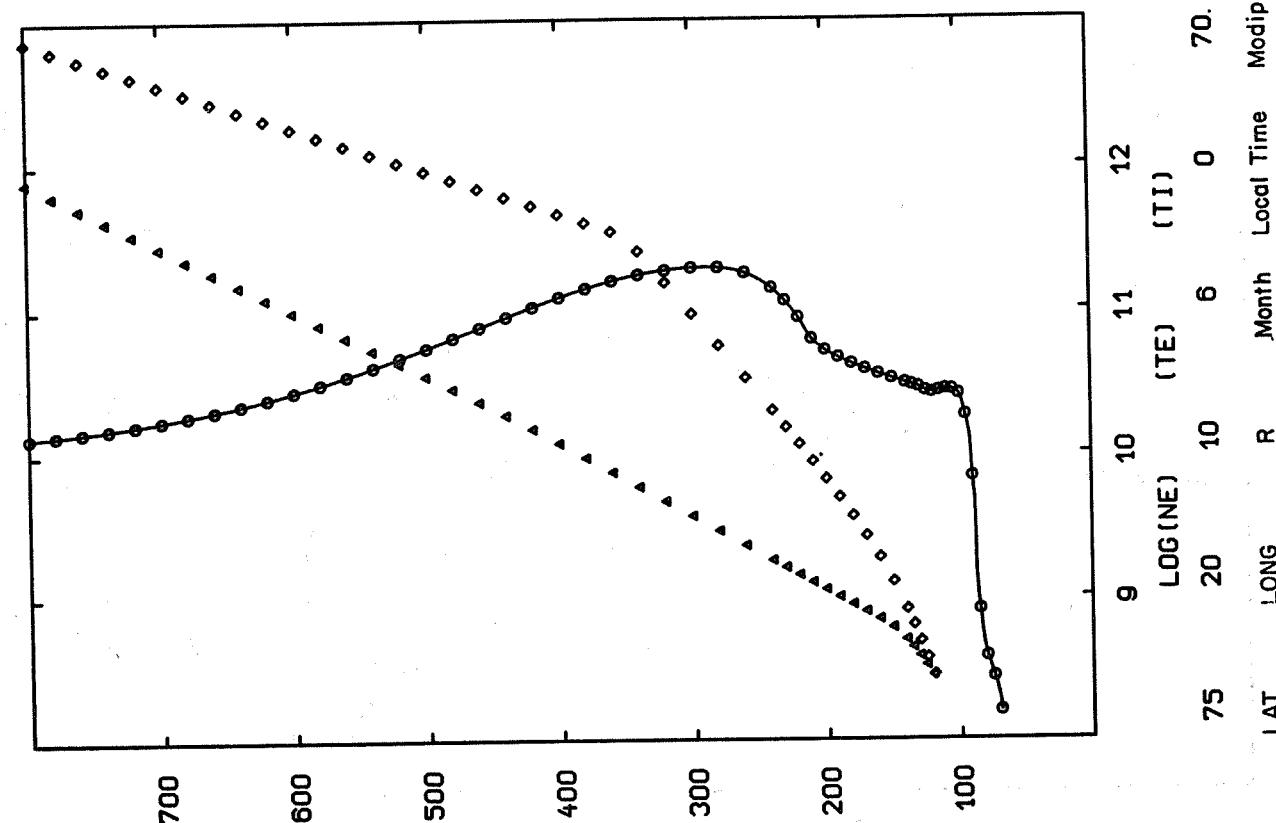
The geographic and time specifications are given in the lowest line under the diagram. From left to right the numerals represent: geographic latitude - geographic longitude - solar activity R - month - local hour - modip. The set covers a total of nine modip values namely - 70, - 50, - 30, - 10, 0, 10, 30, 50 and 70. The longitude was chosen to be $20^\circ E$, for all of these examples. Eight pages for each value are subdivided according to solar activity ($R = 10$ and 100), month (March and June) and local hour (sunrise and 14h).



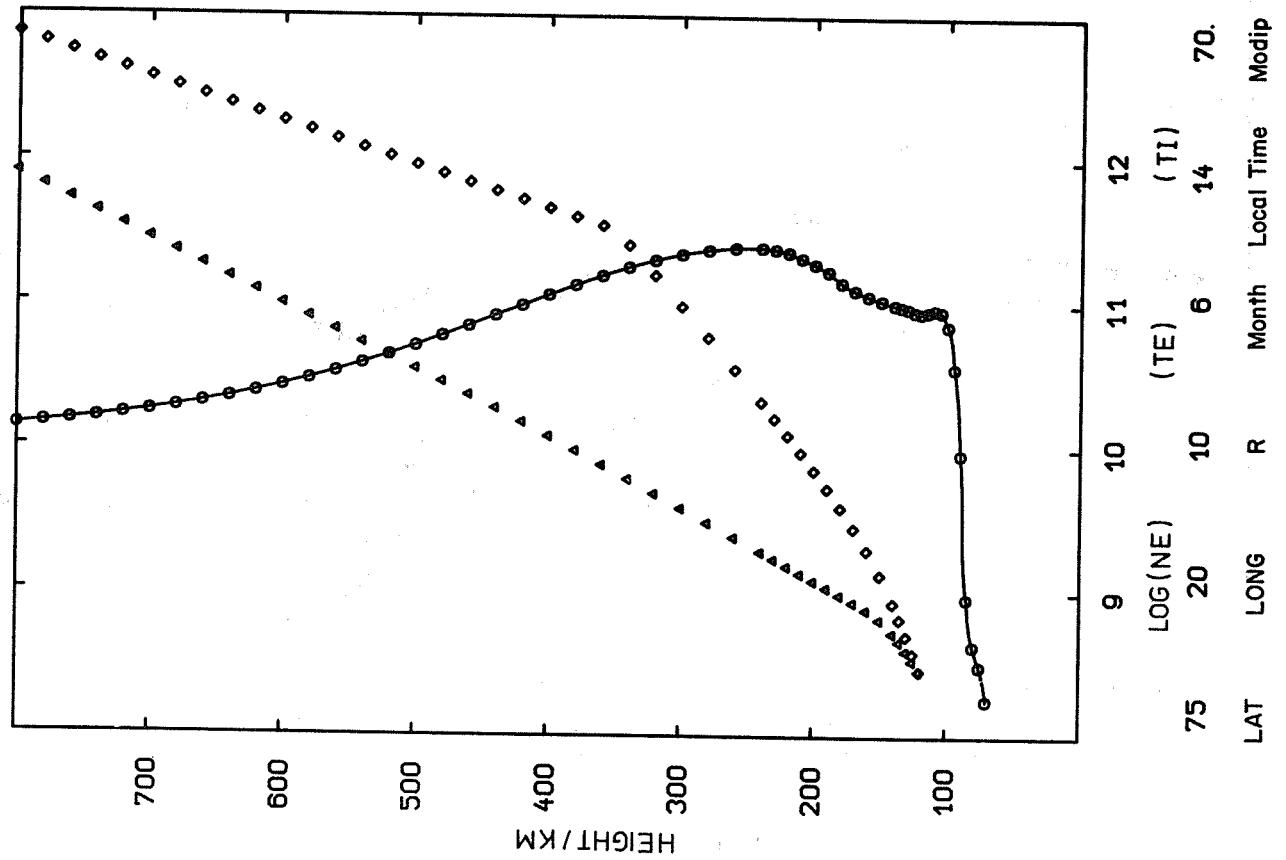
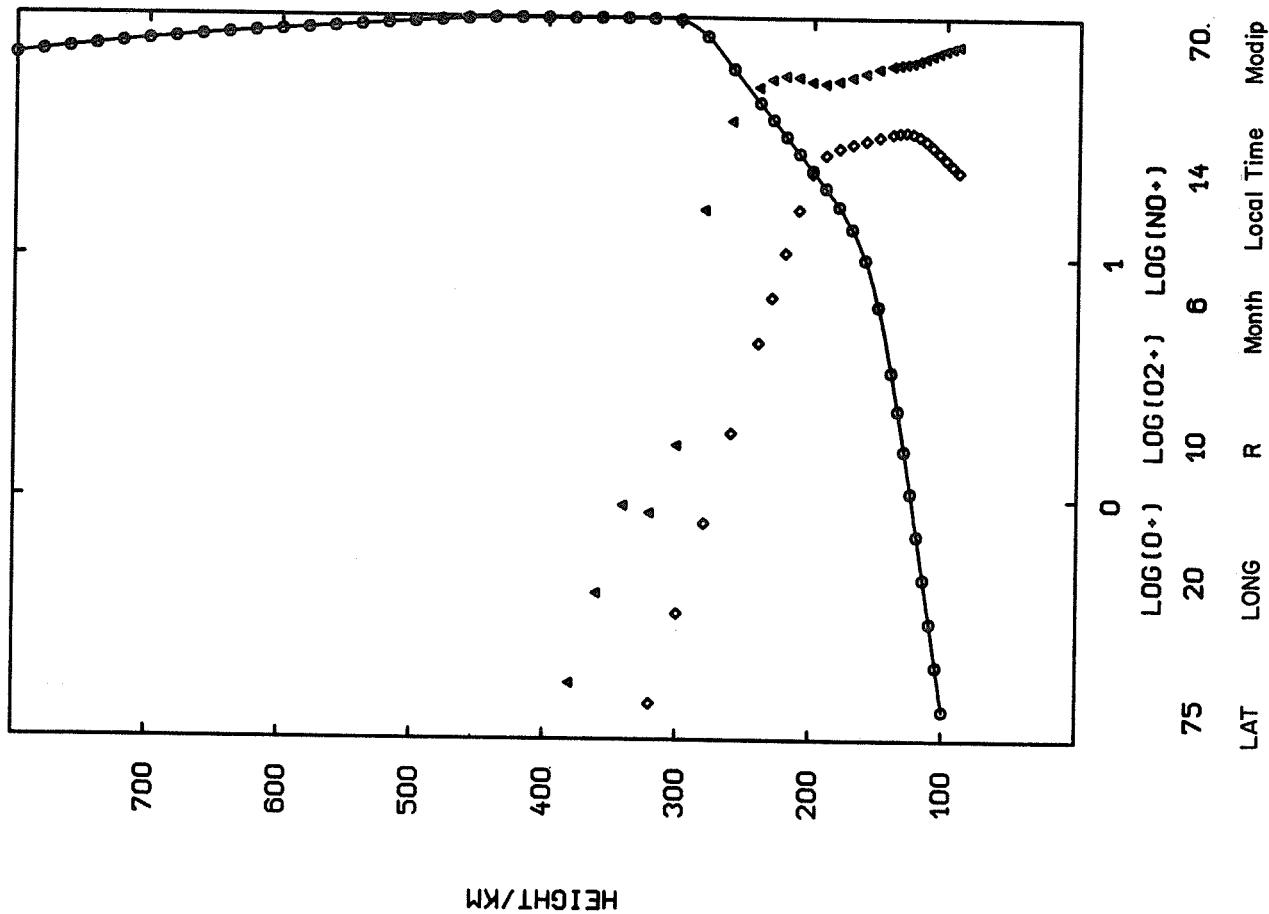


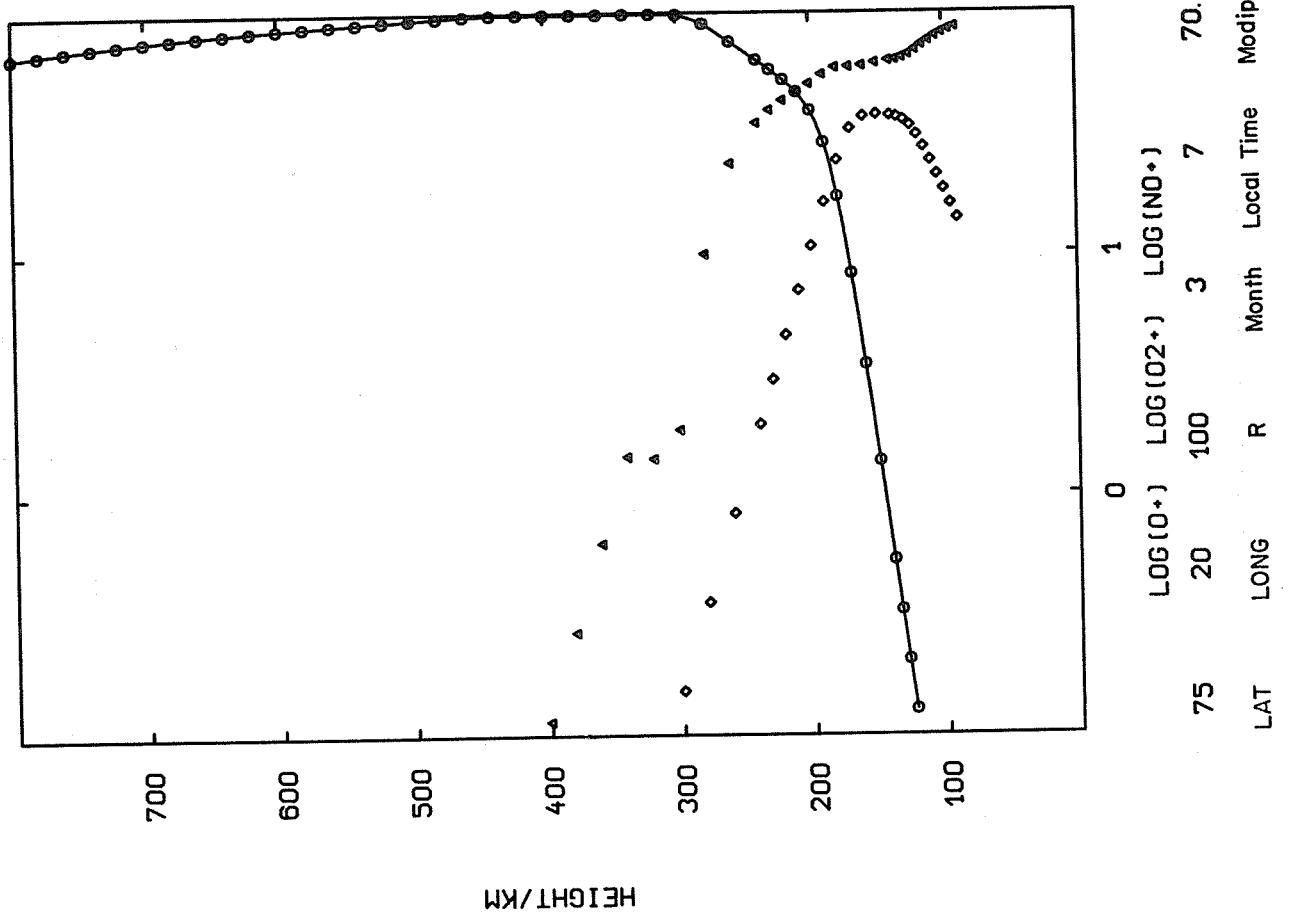


HEIGHT/km

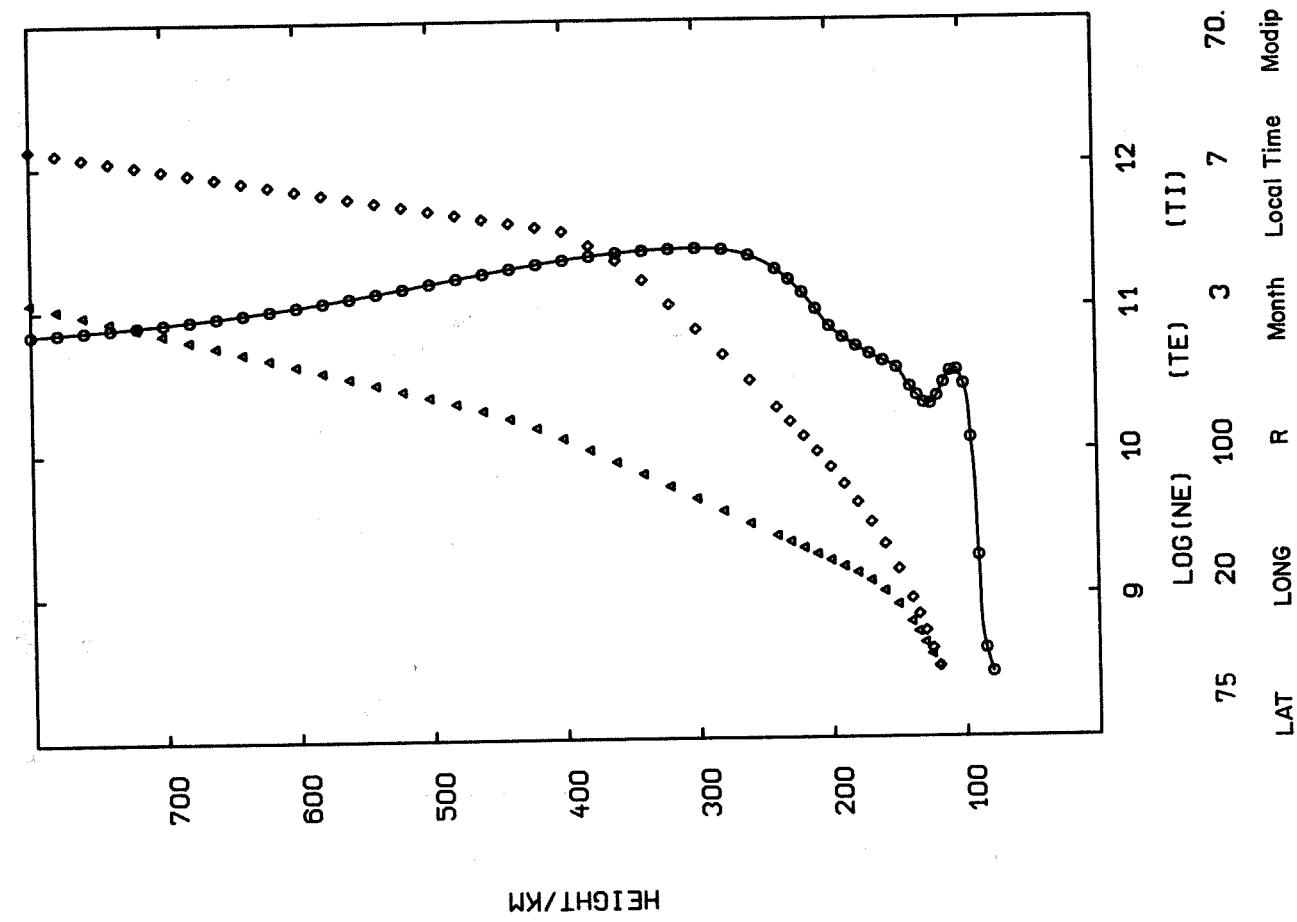


HEIGHT/km

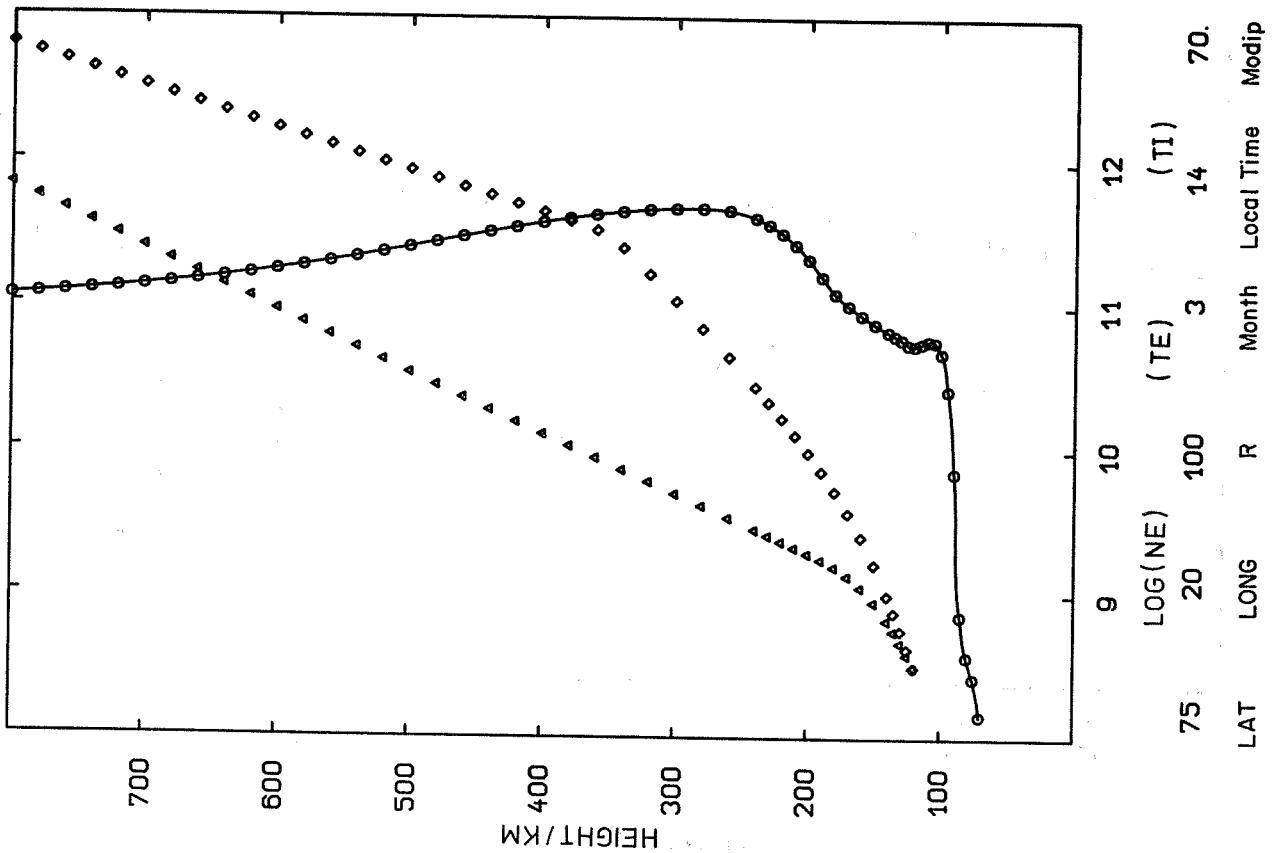
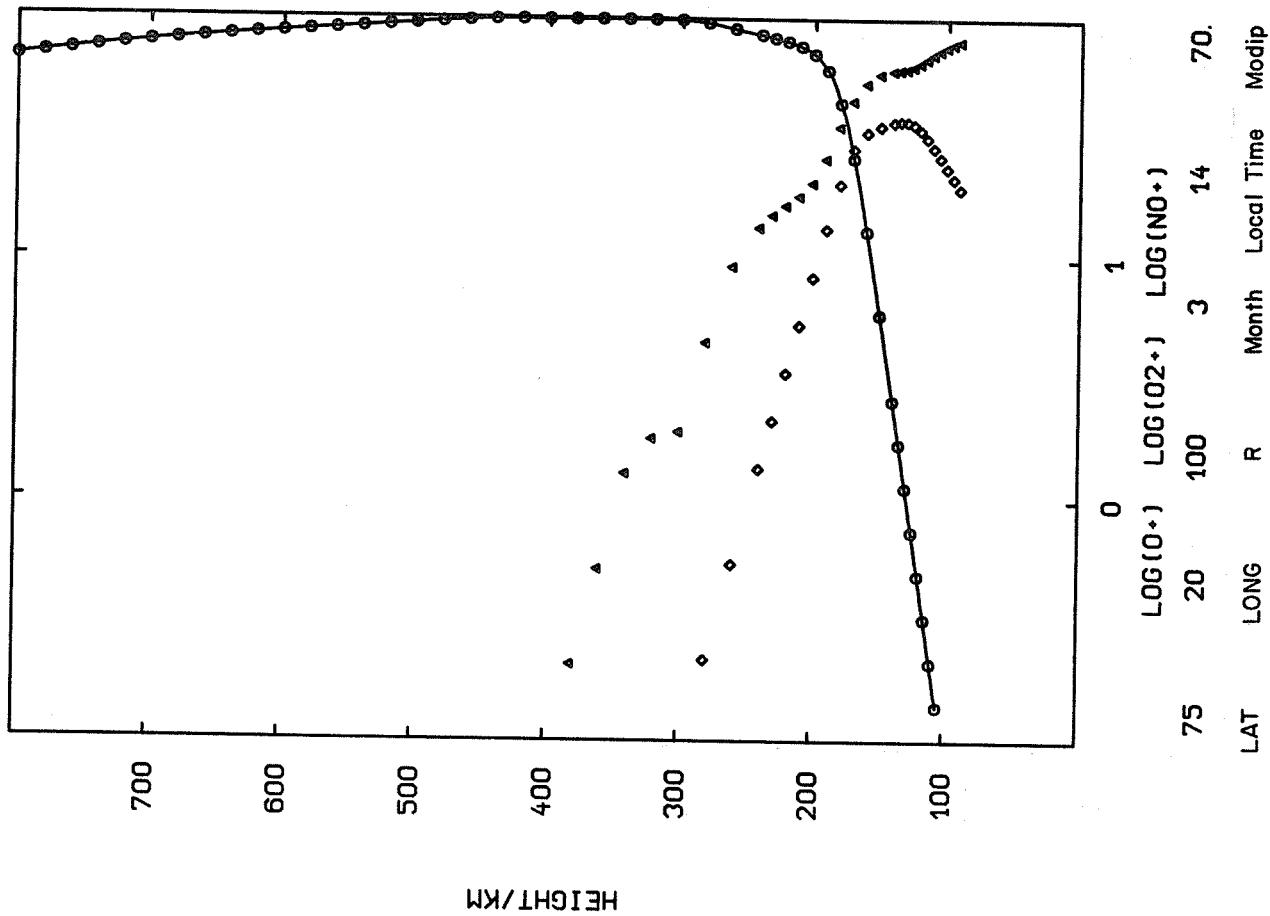


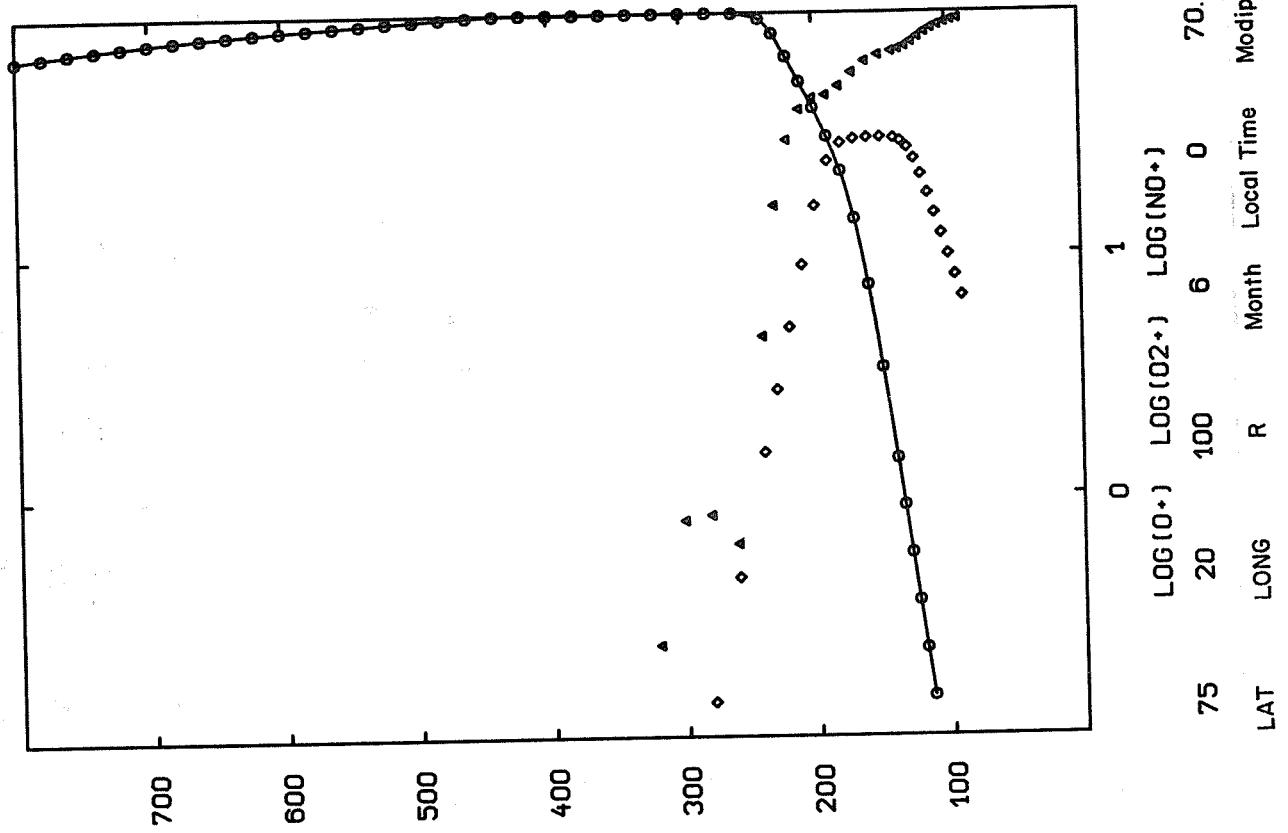


HEIGHT / KM

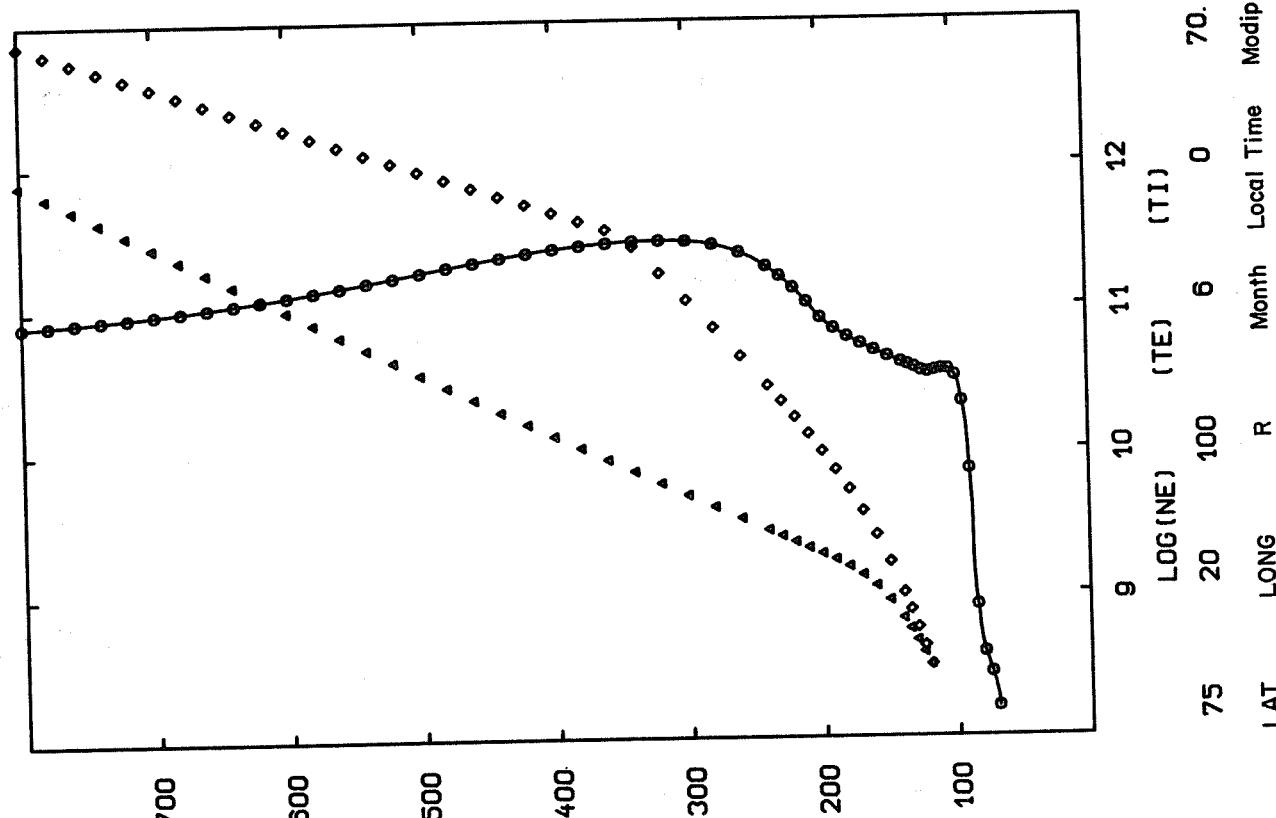


HEIGHT / KM

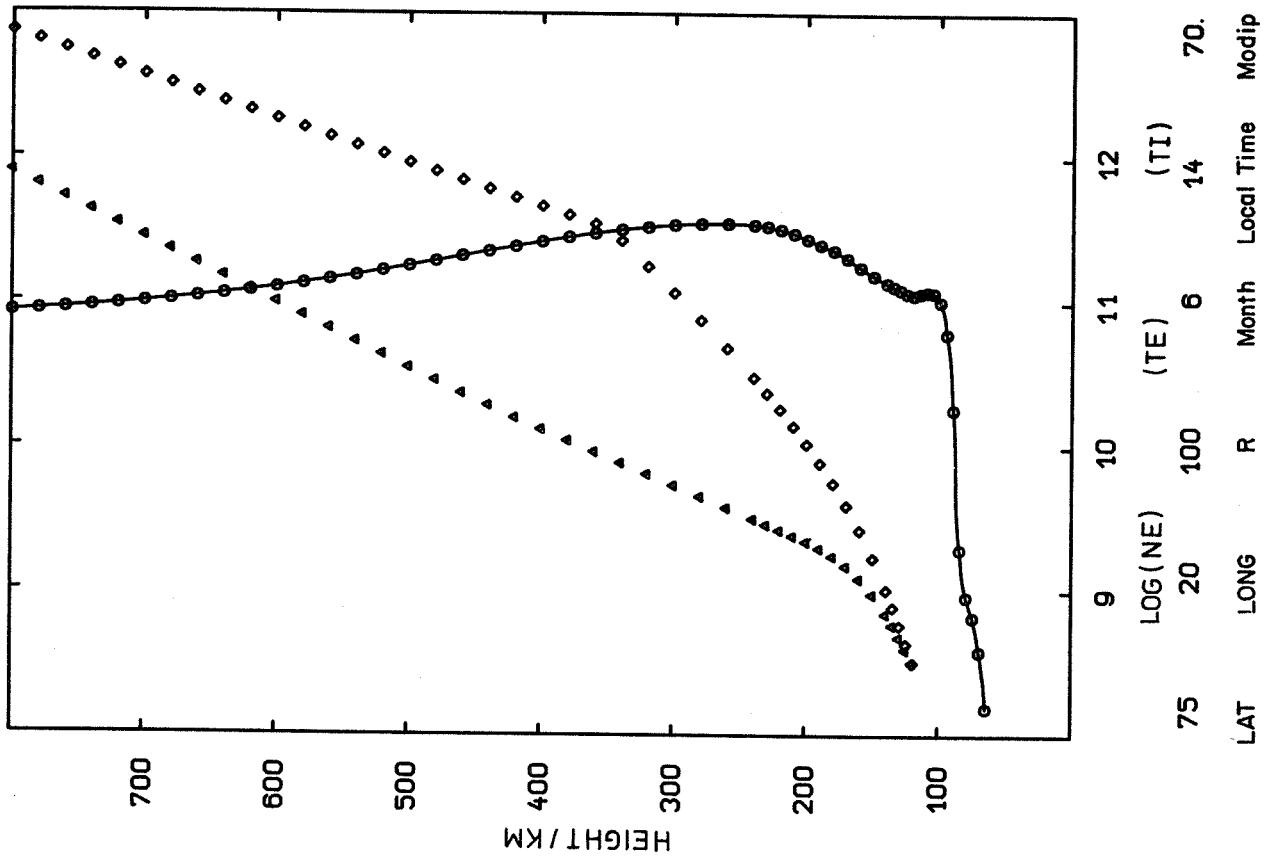
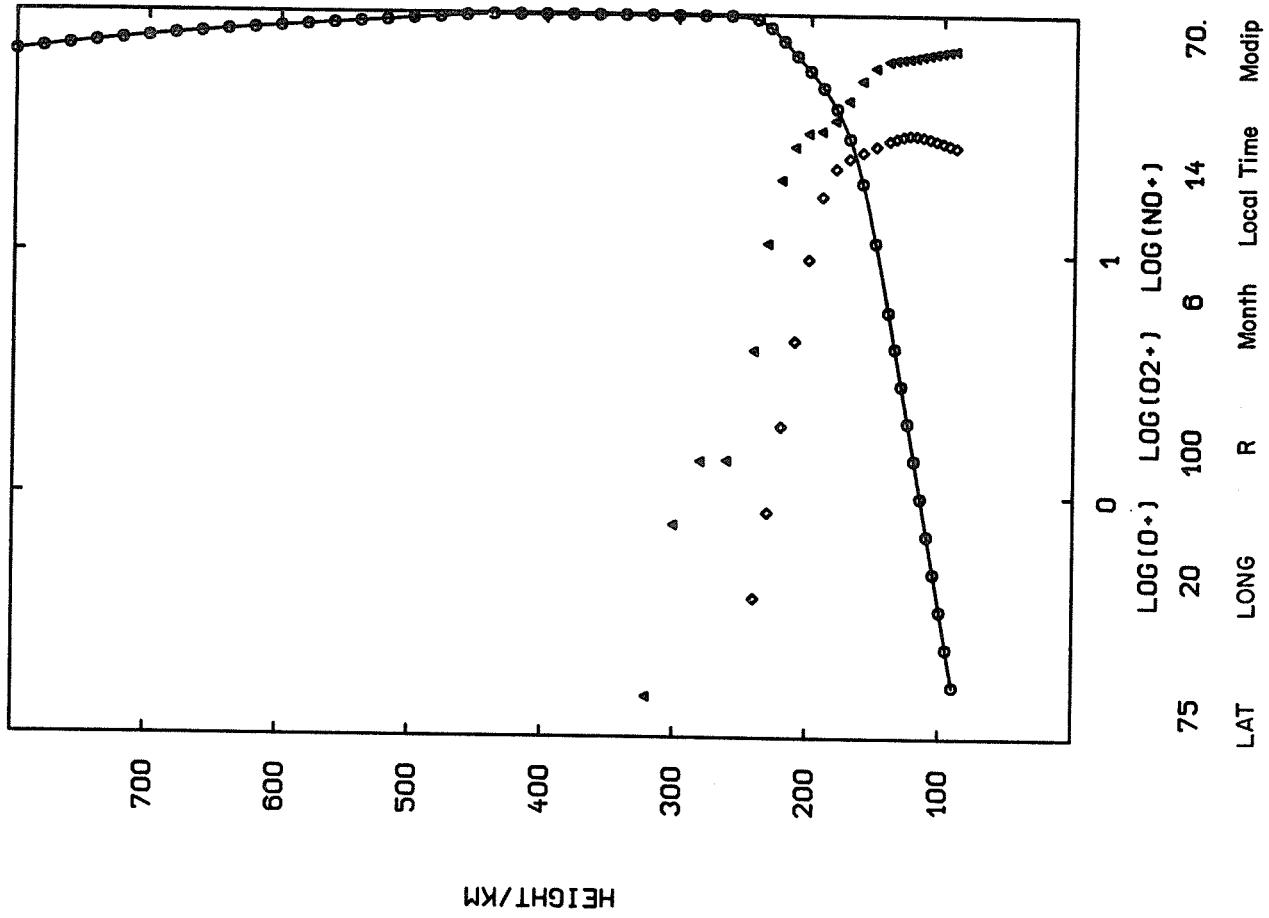


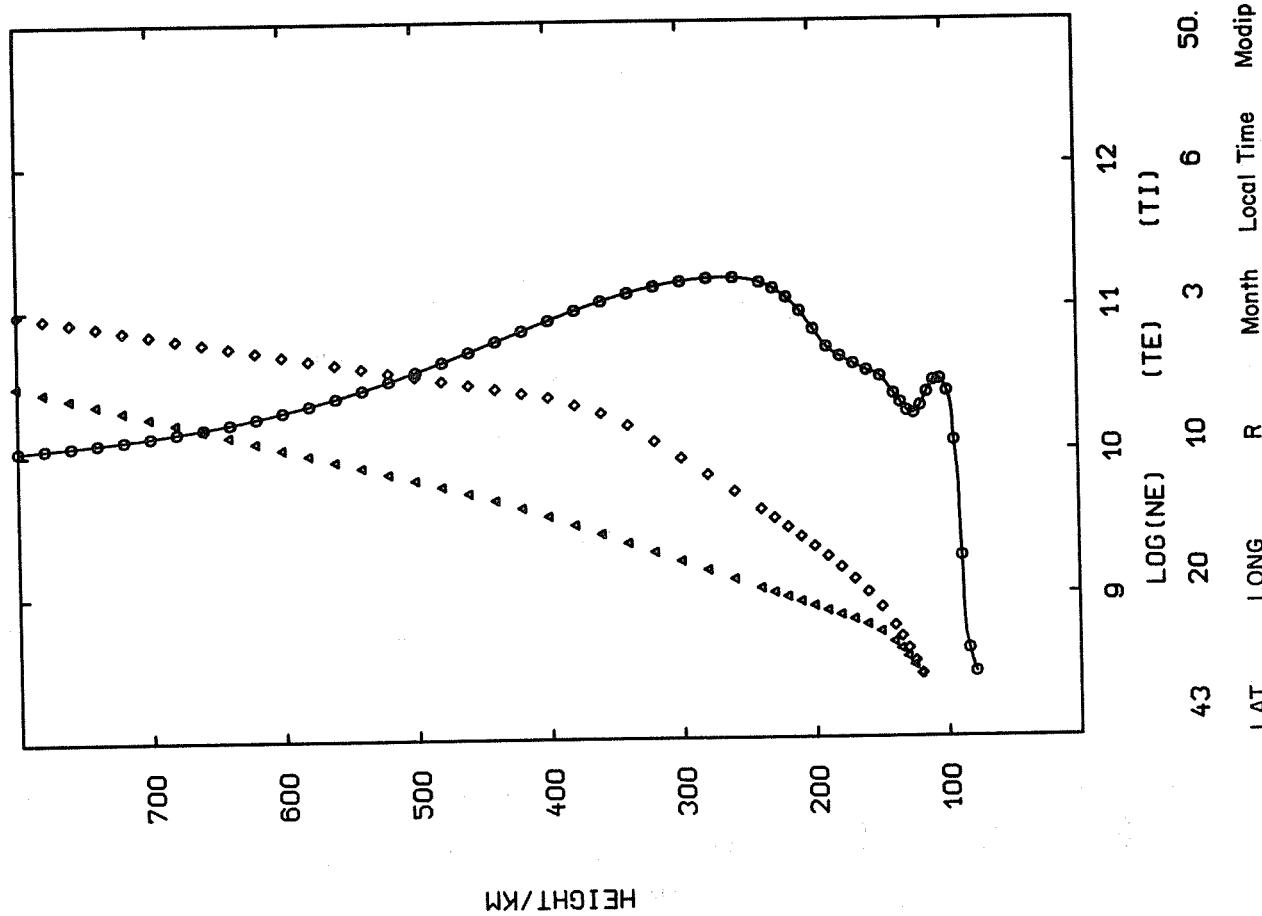
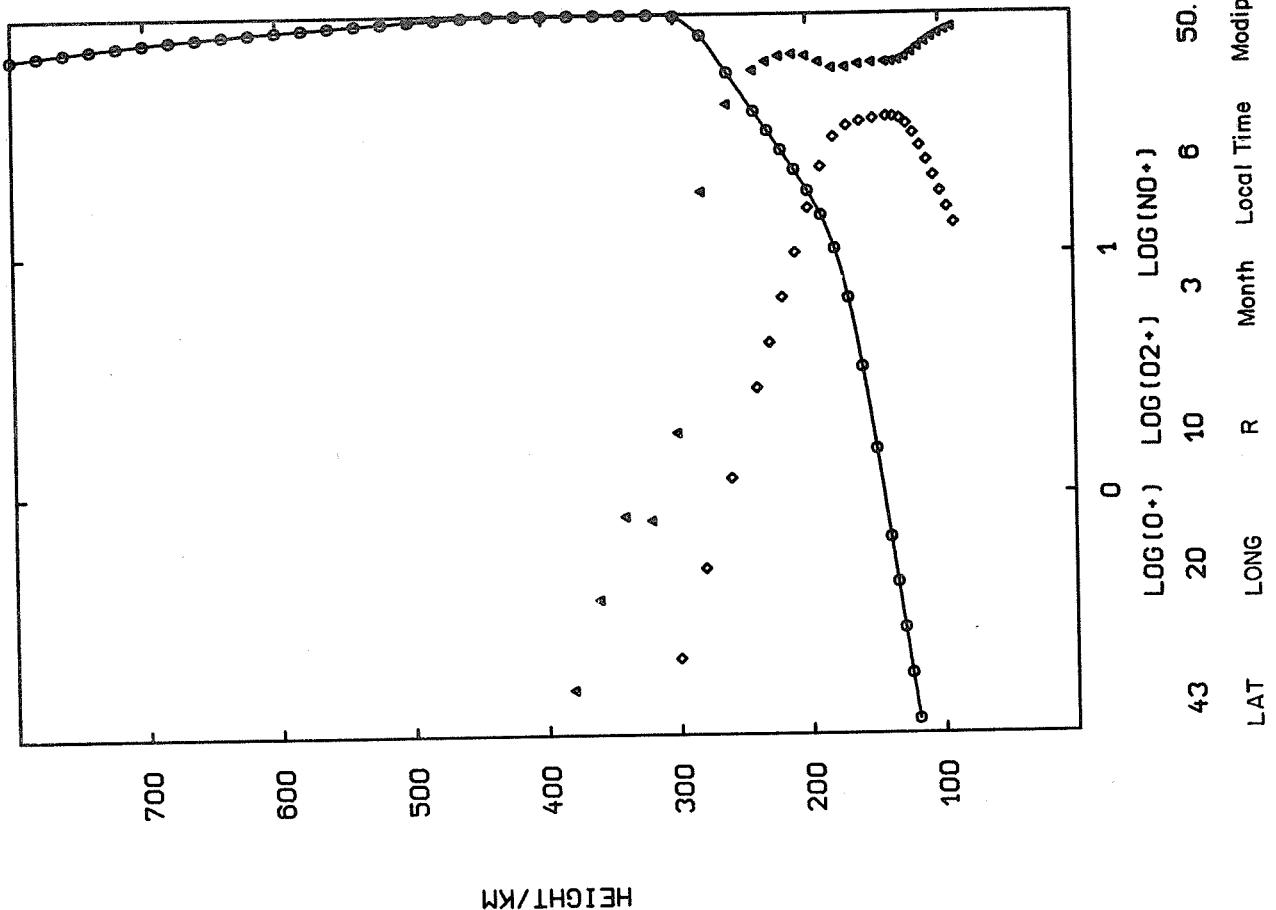


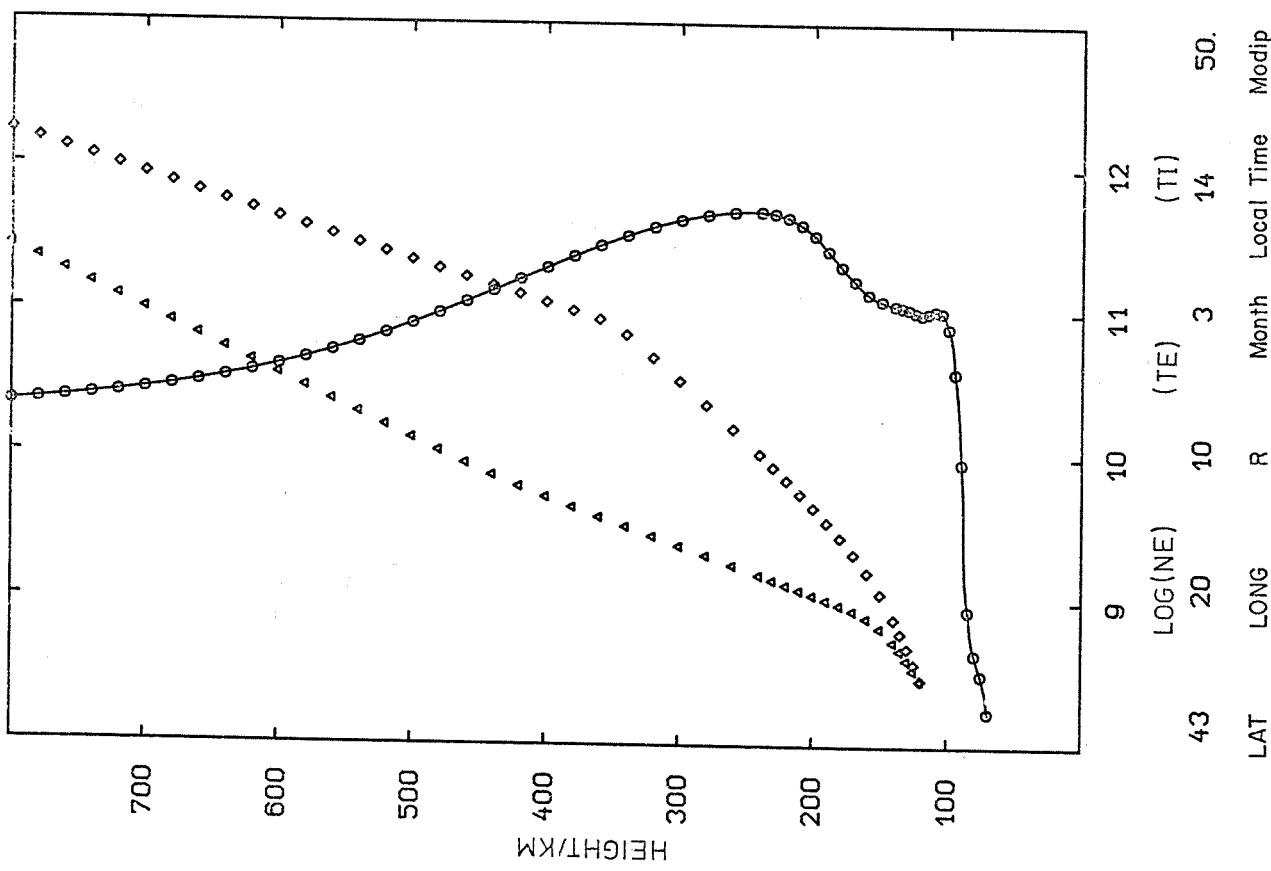
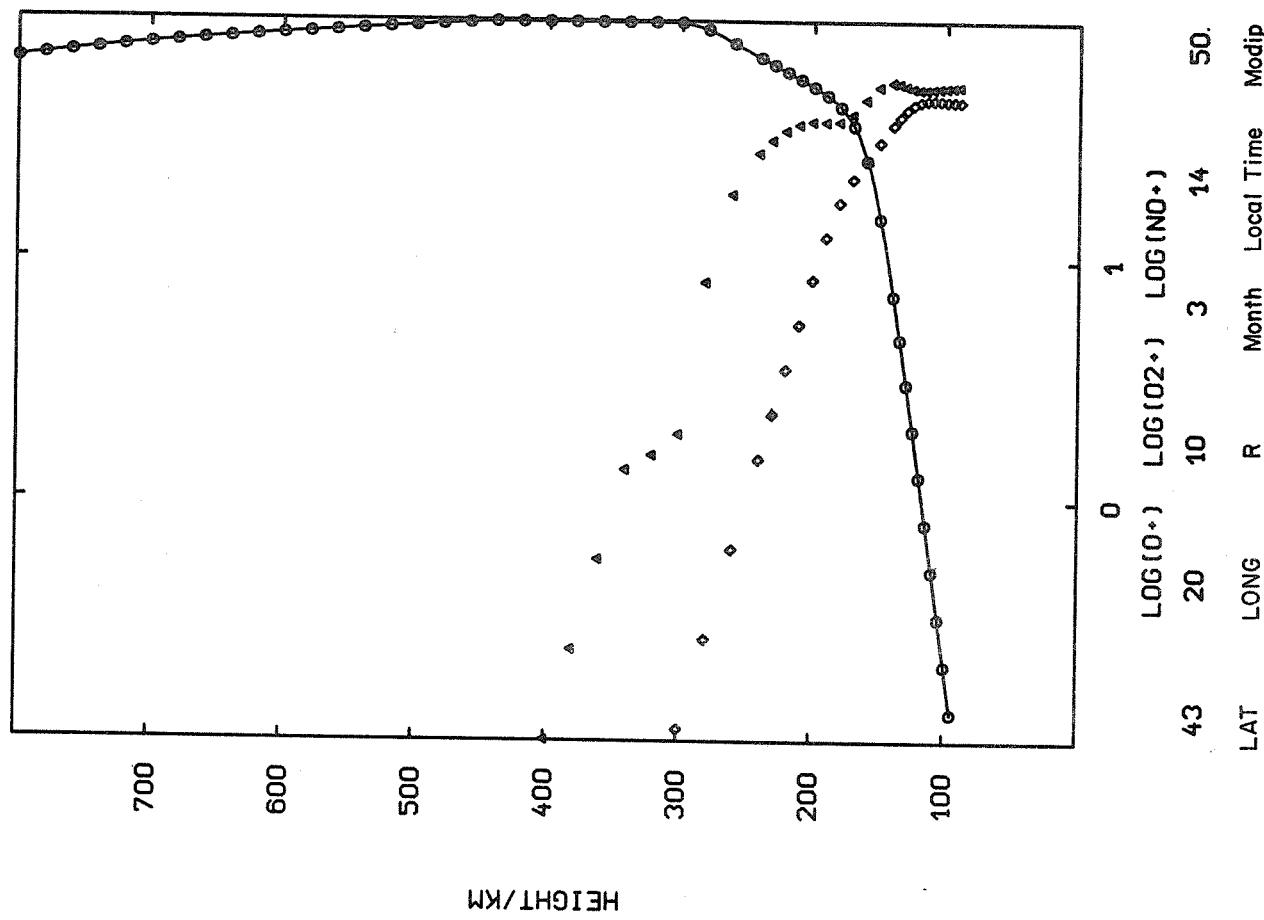
HEIGHT/km

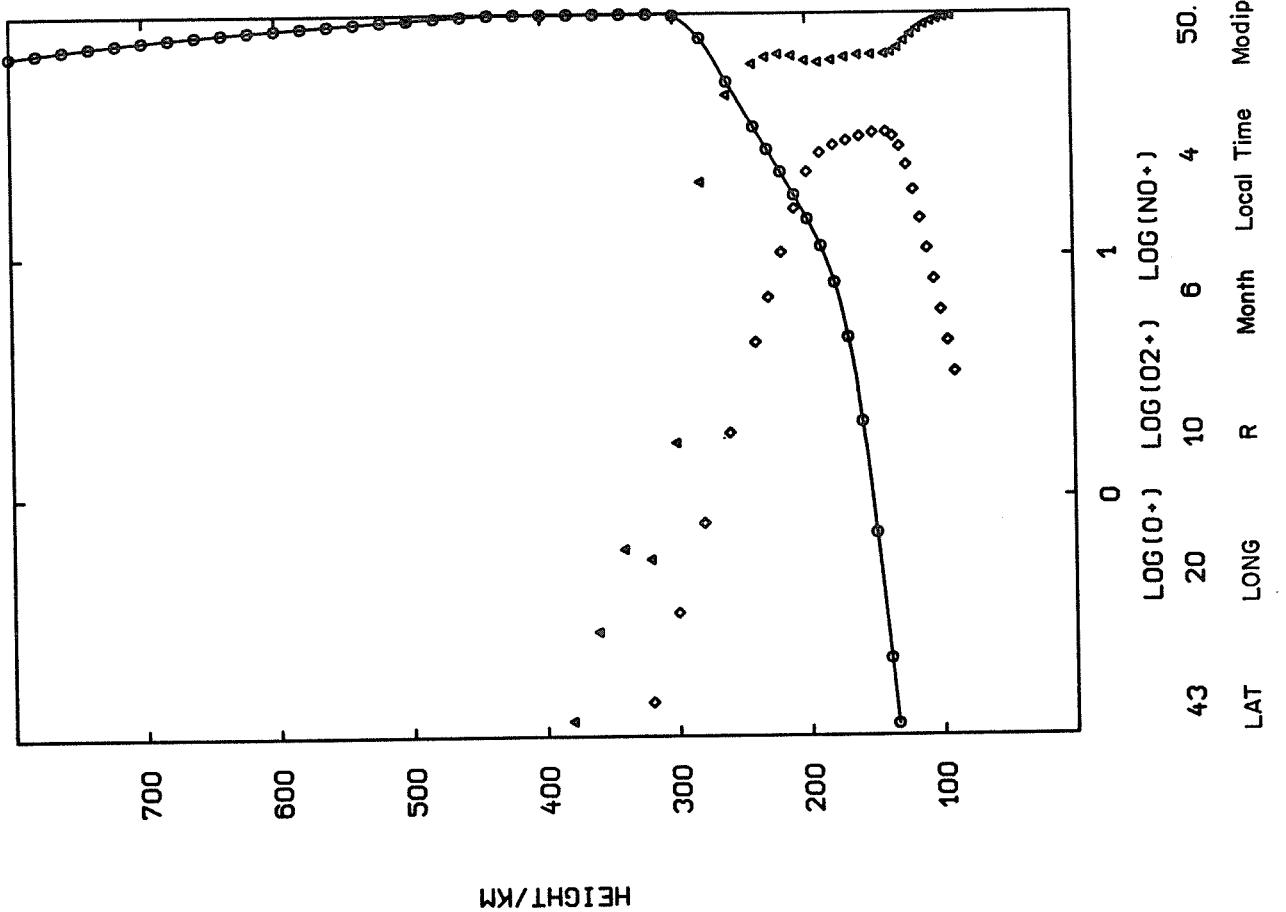


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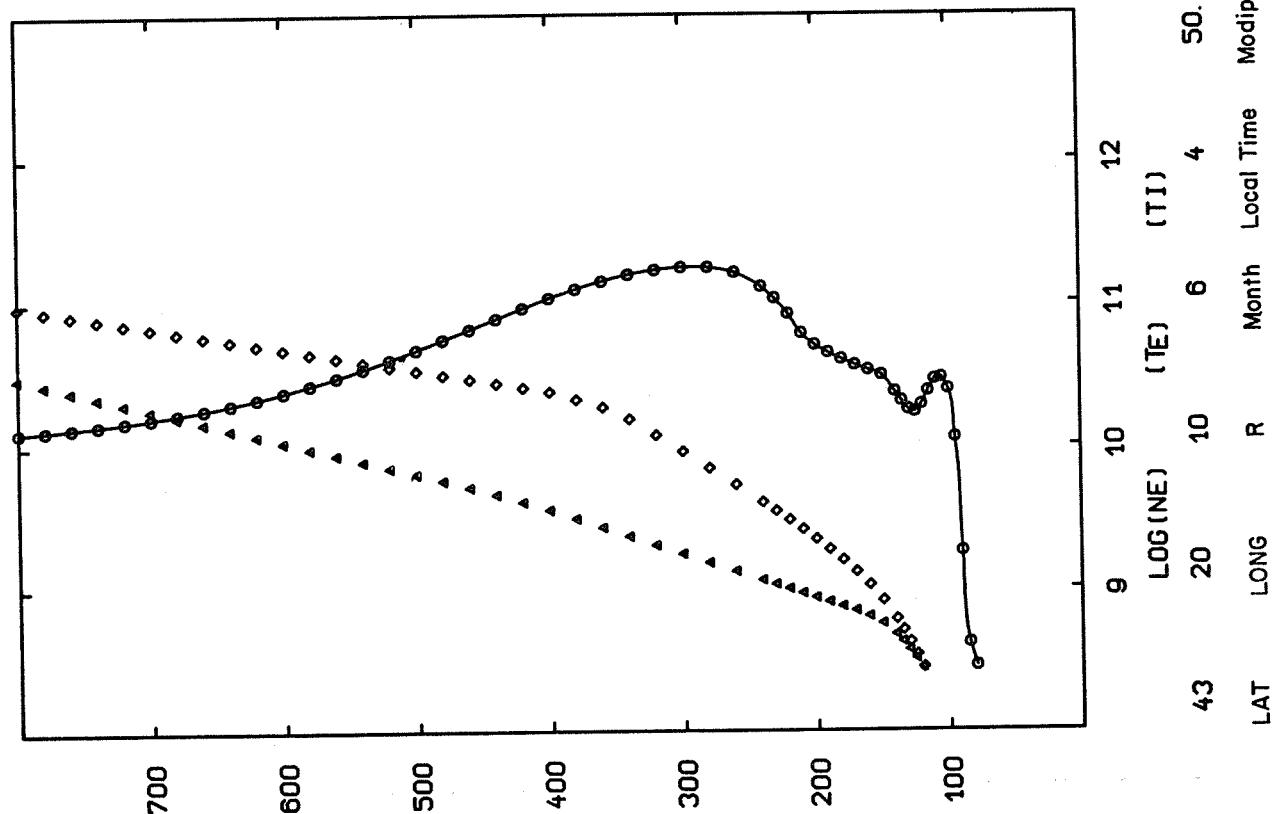




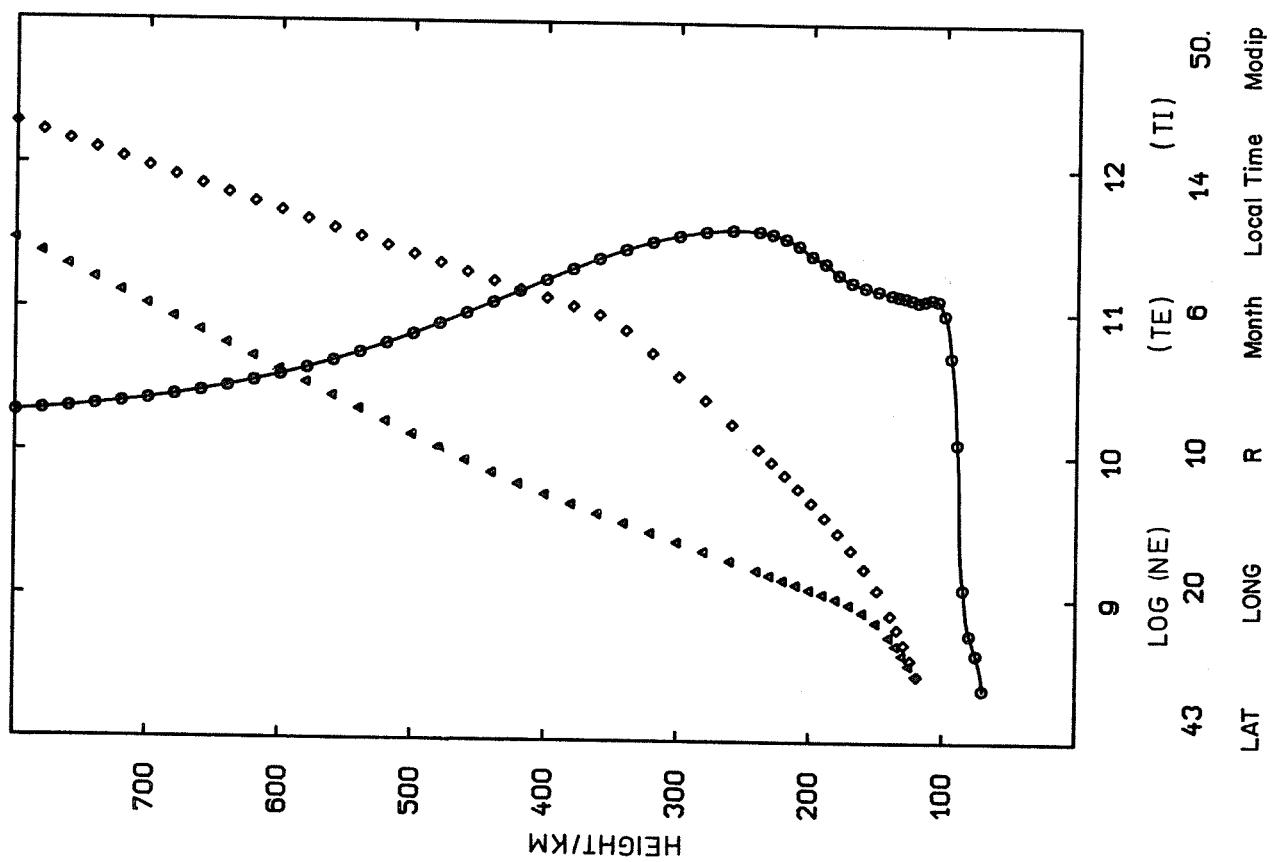
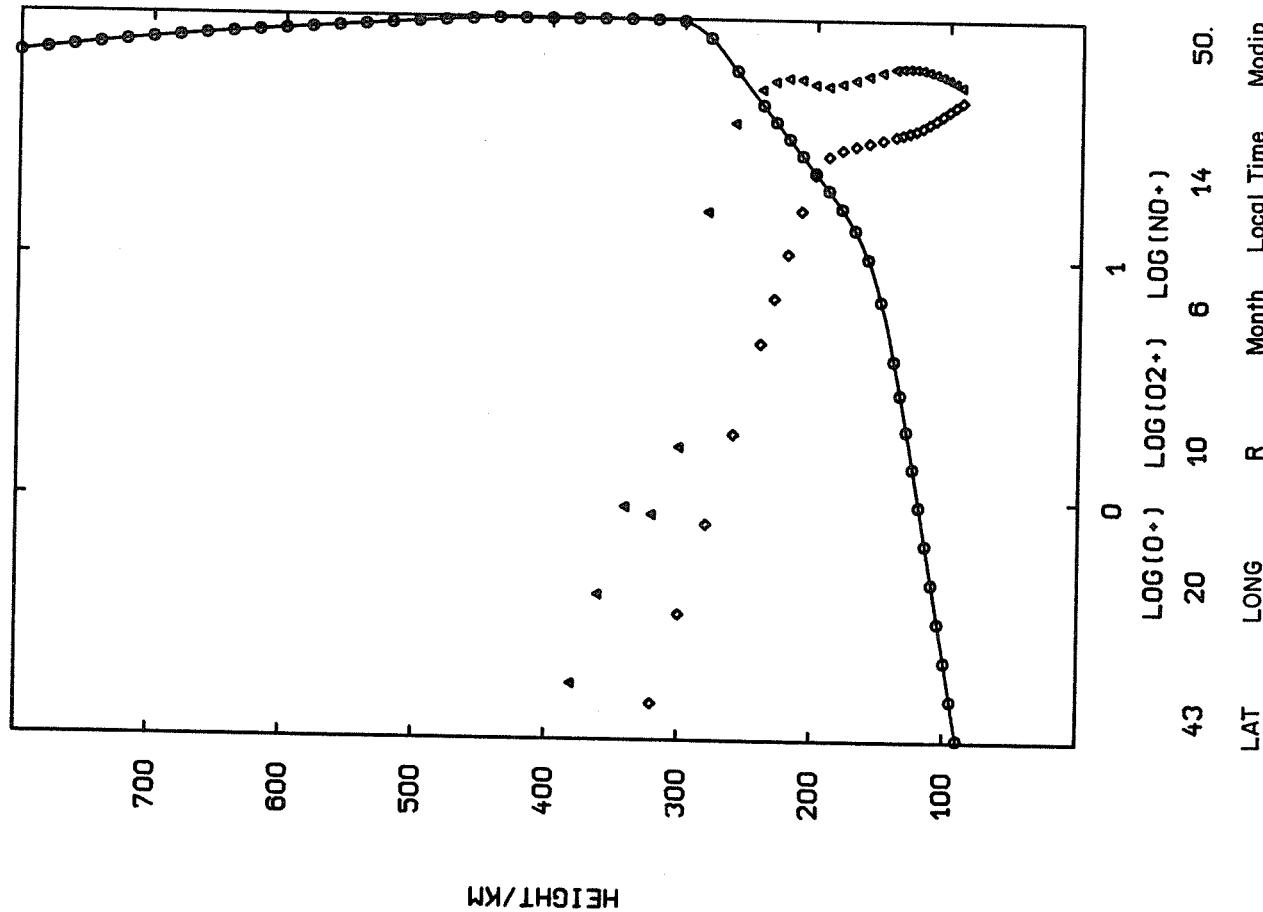


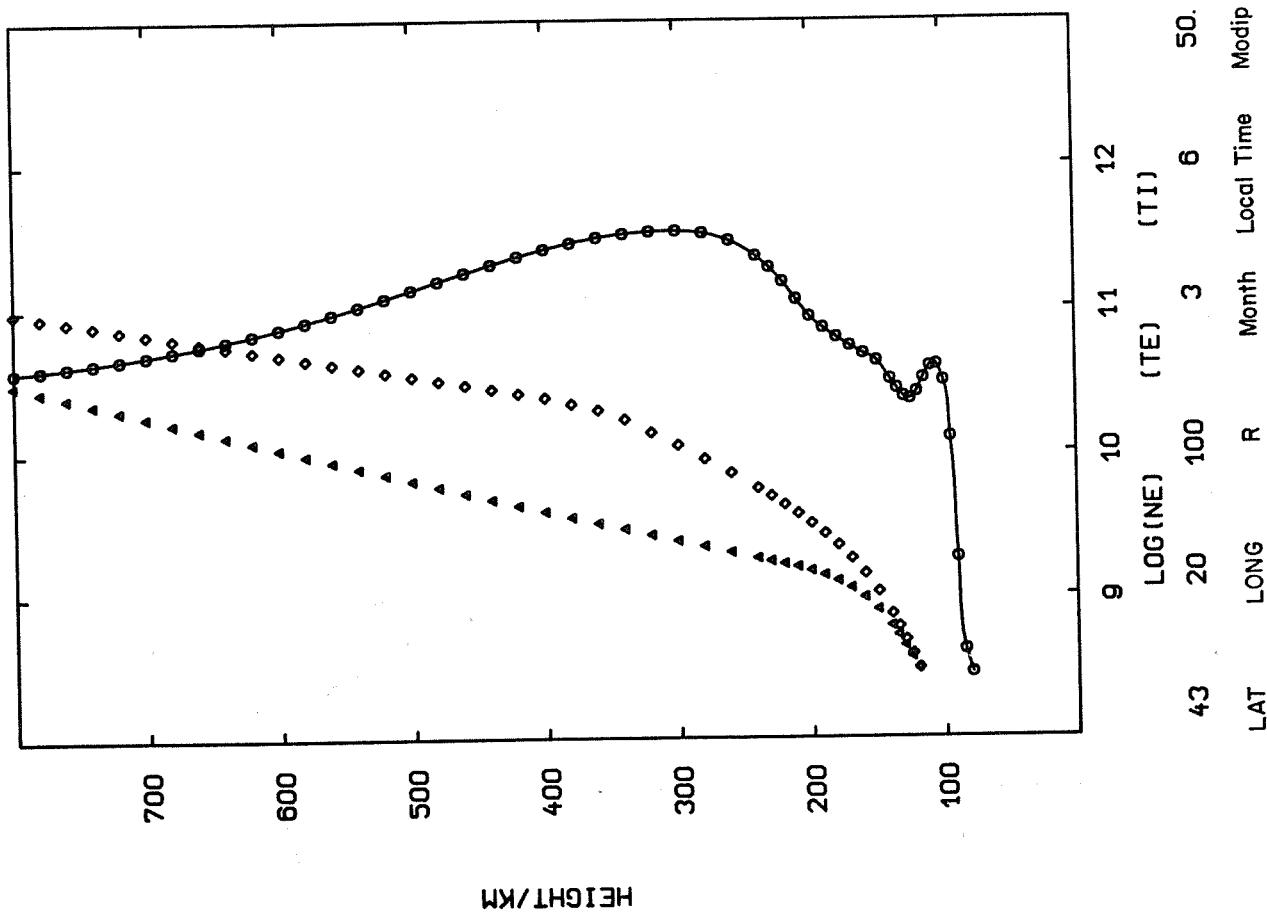
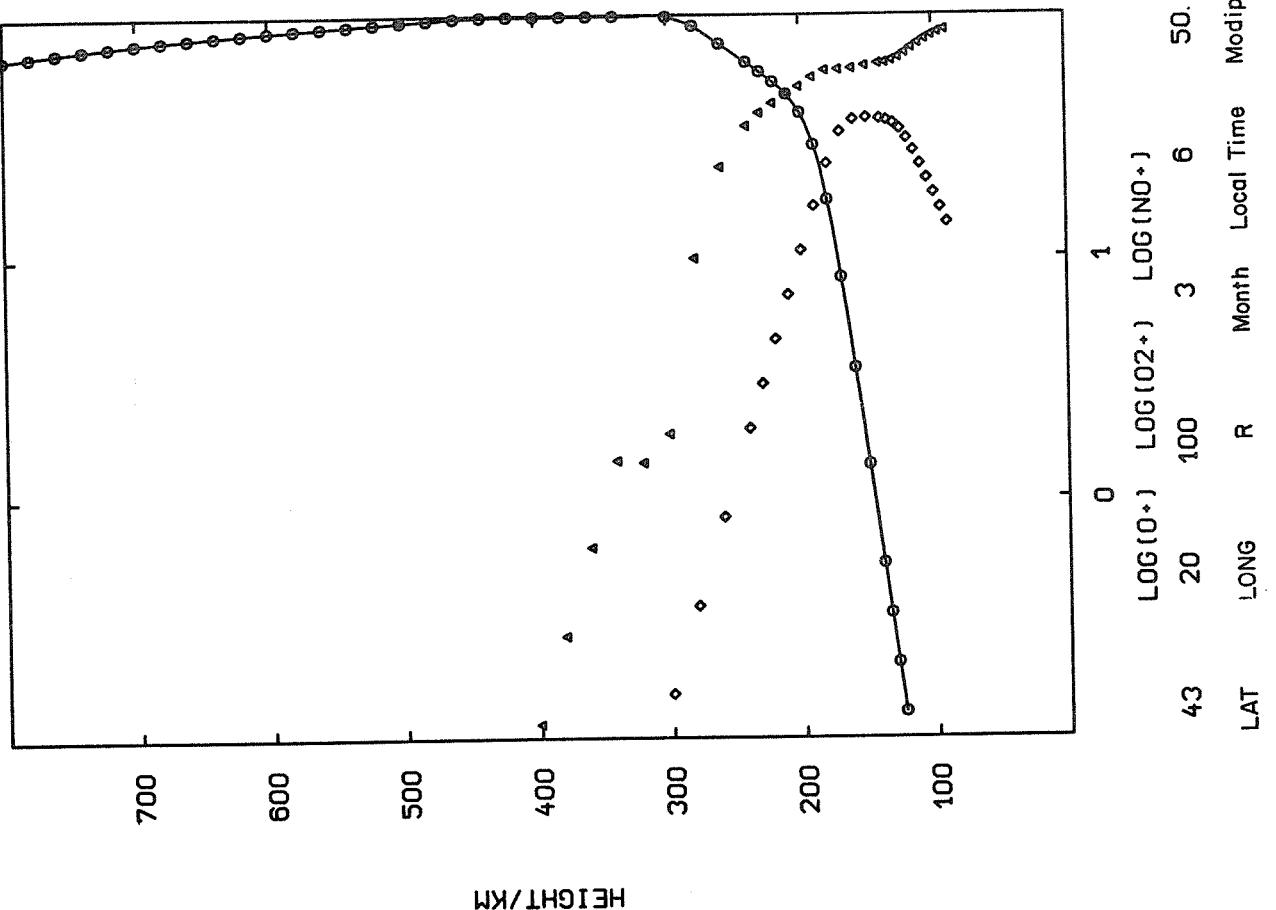


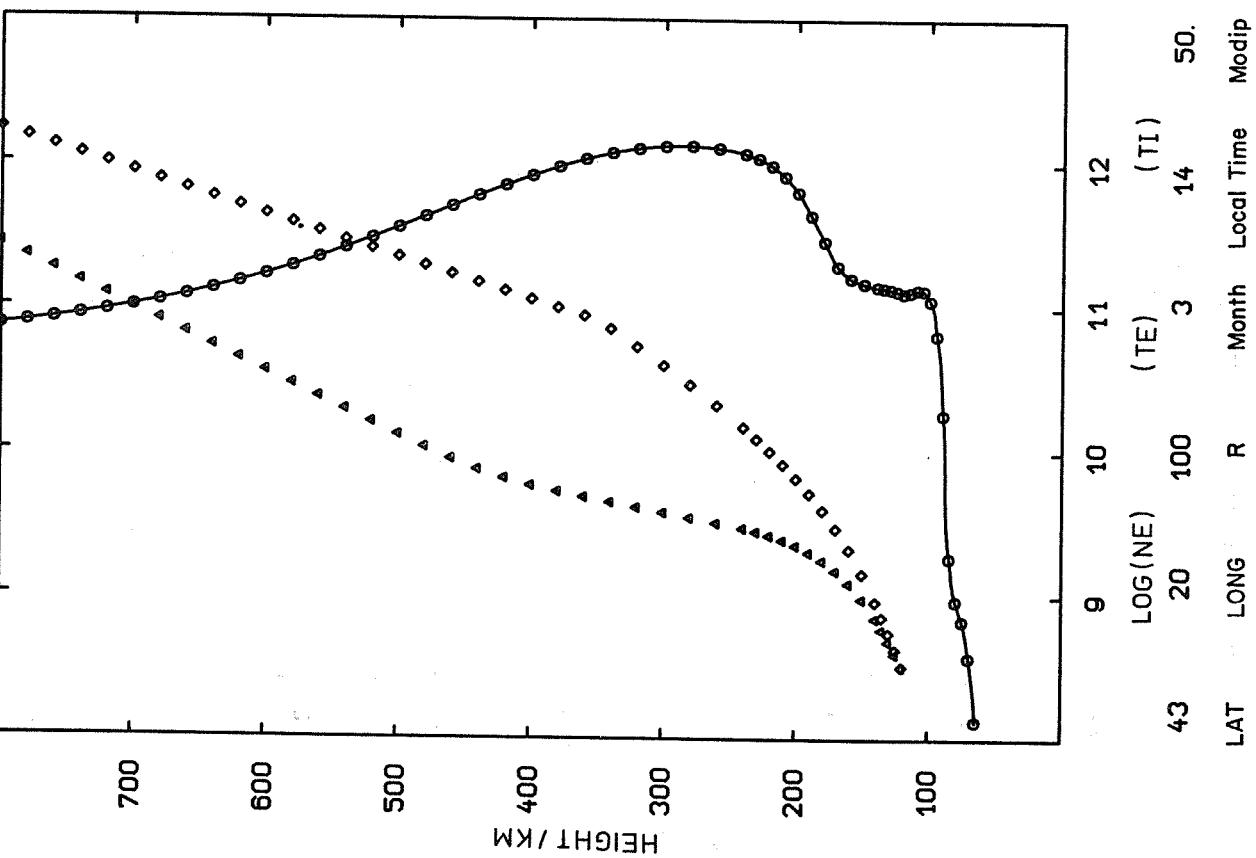
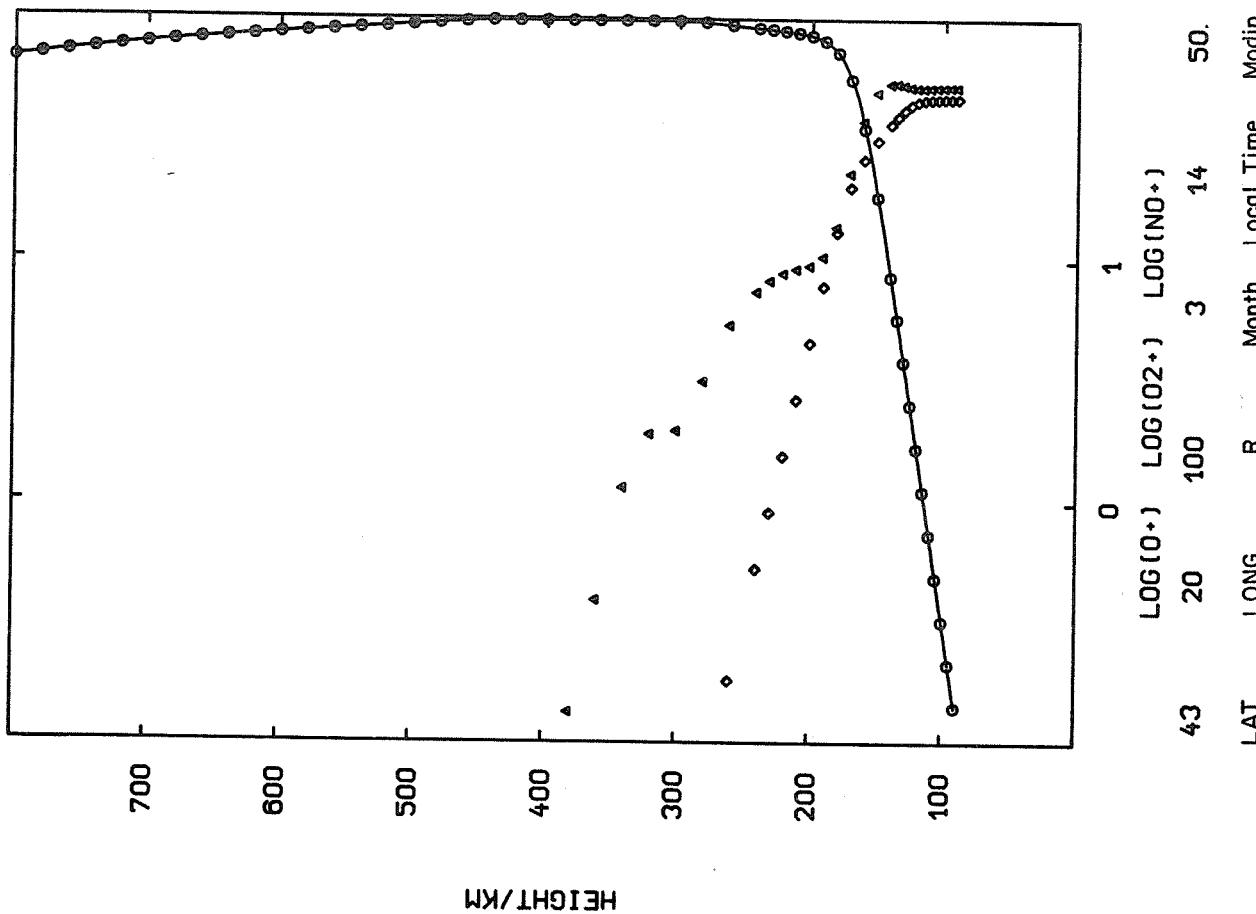
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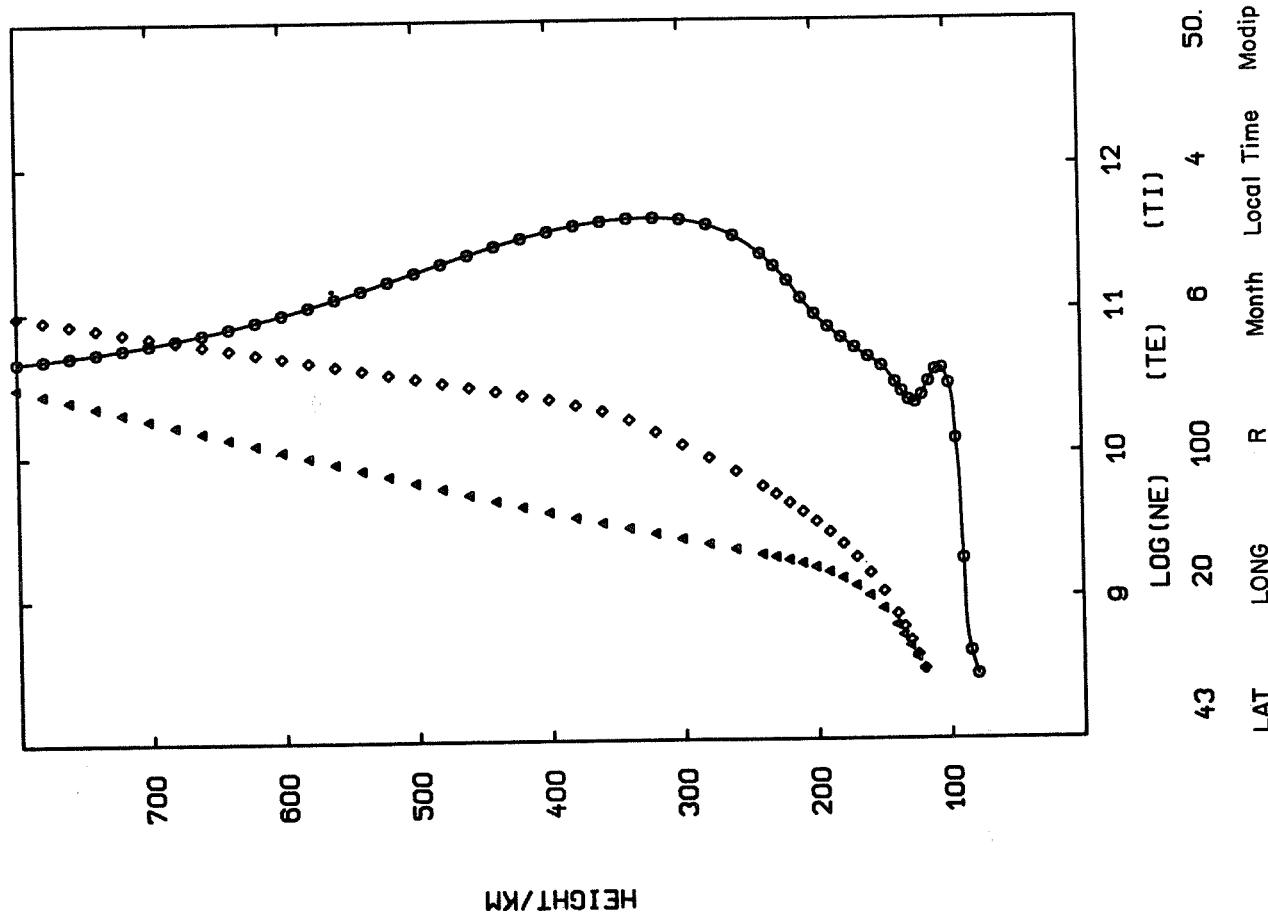
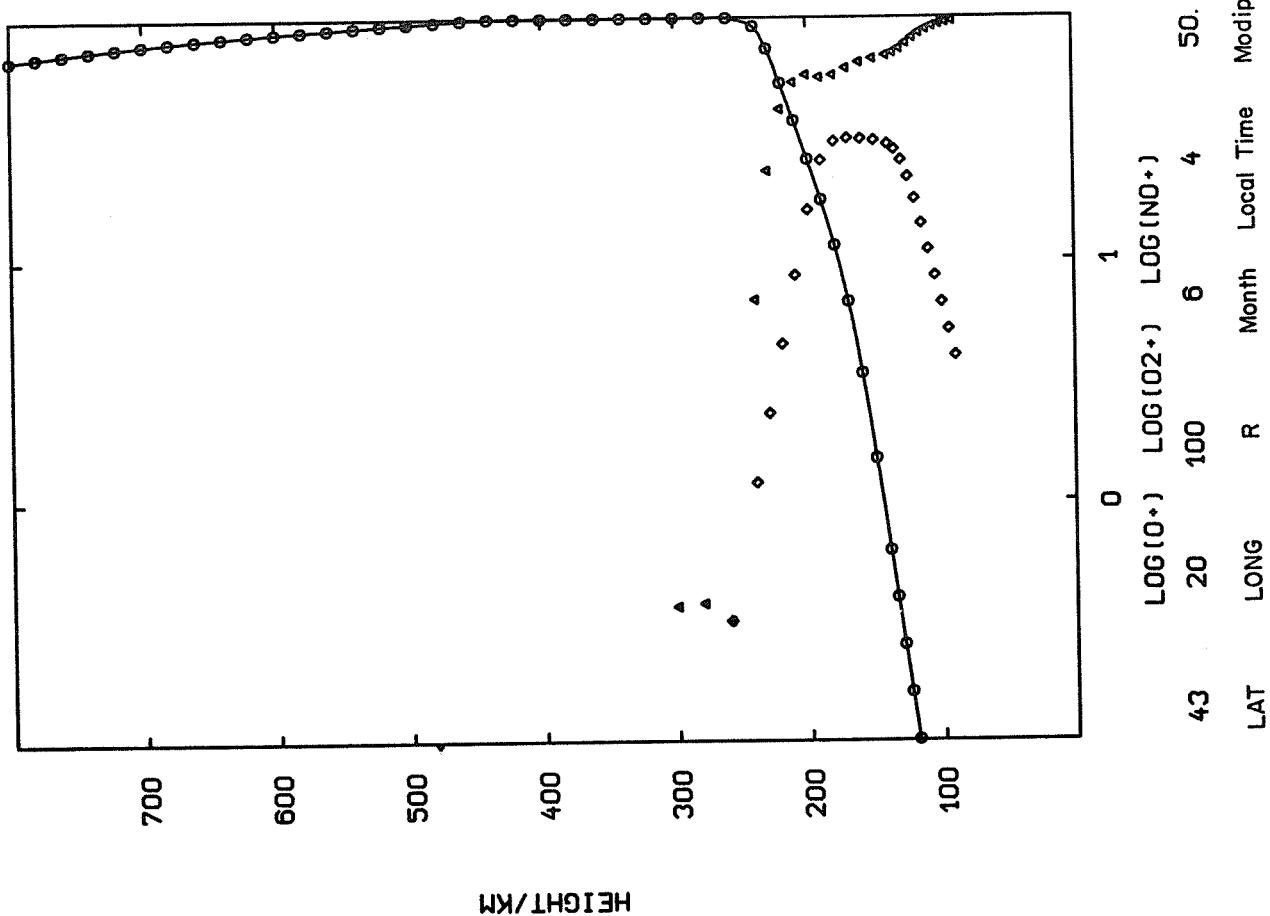


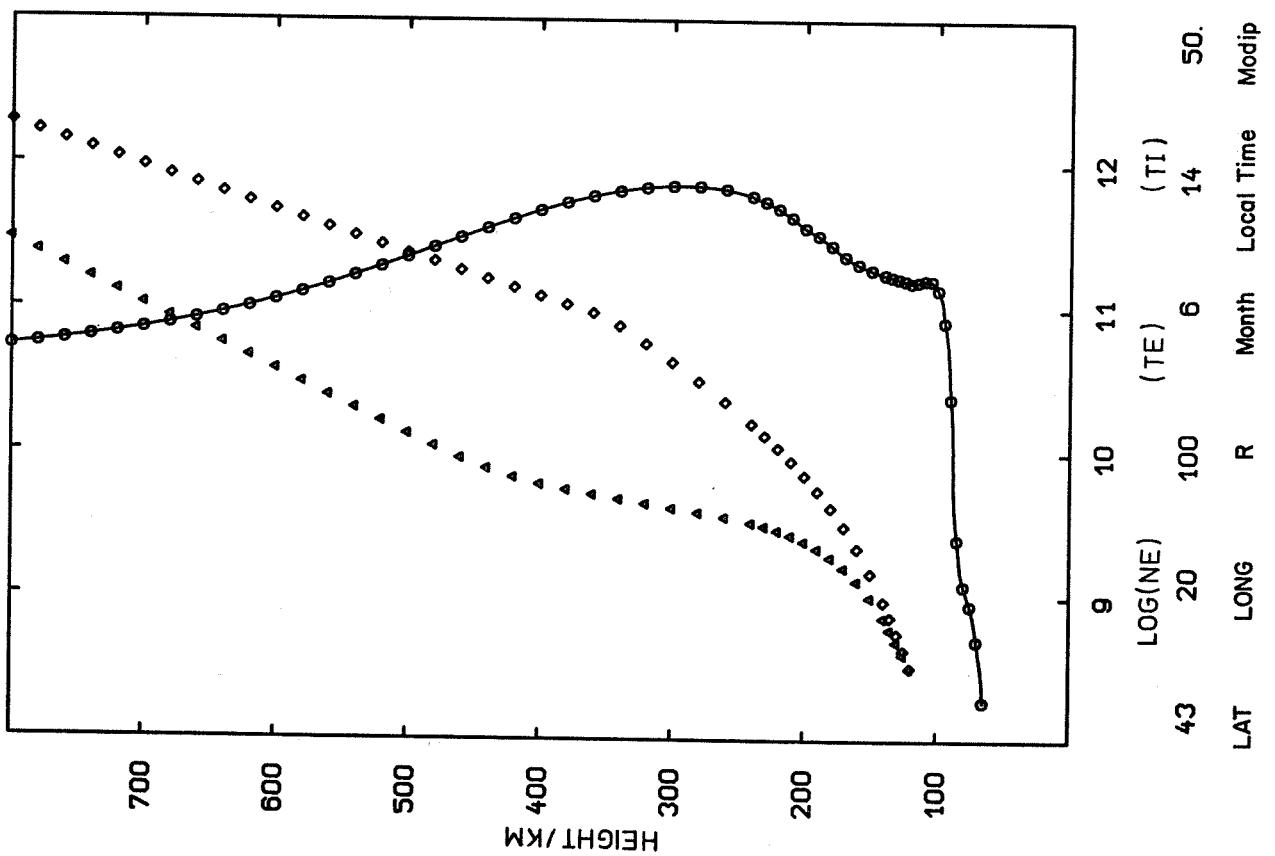
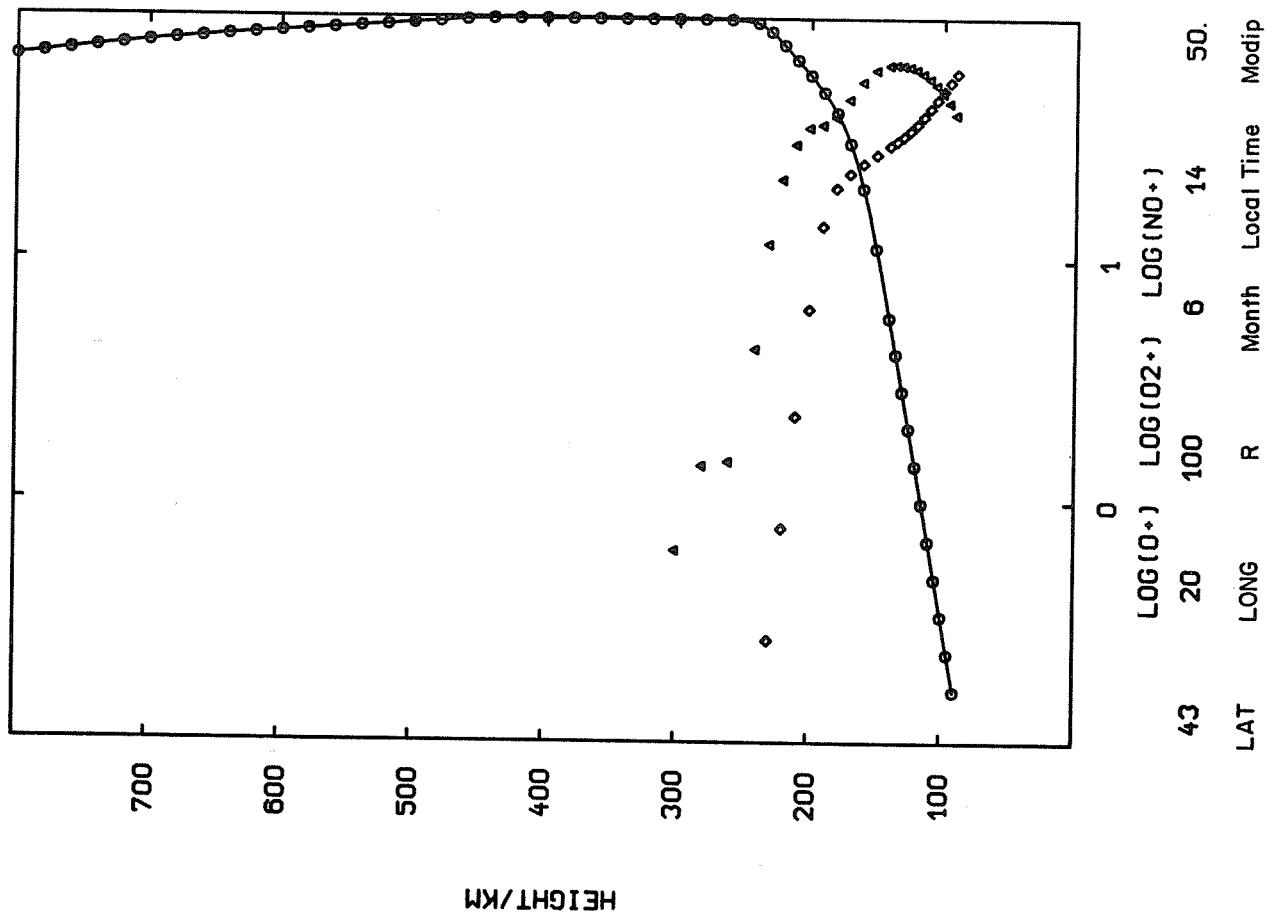
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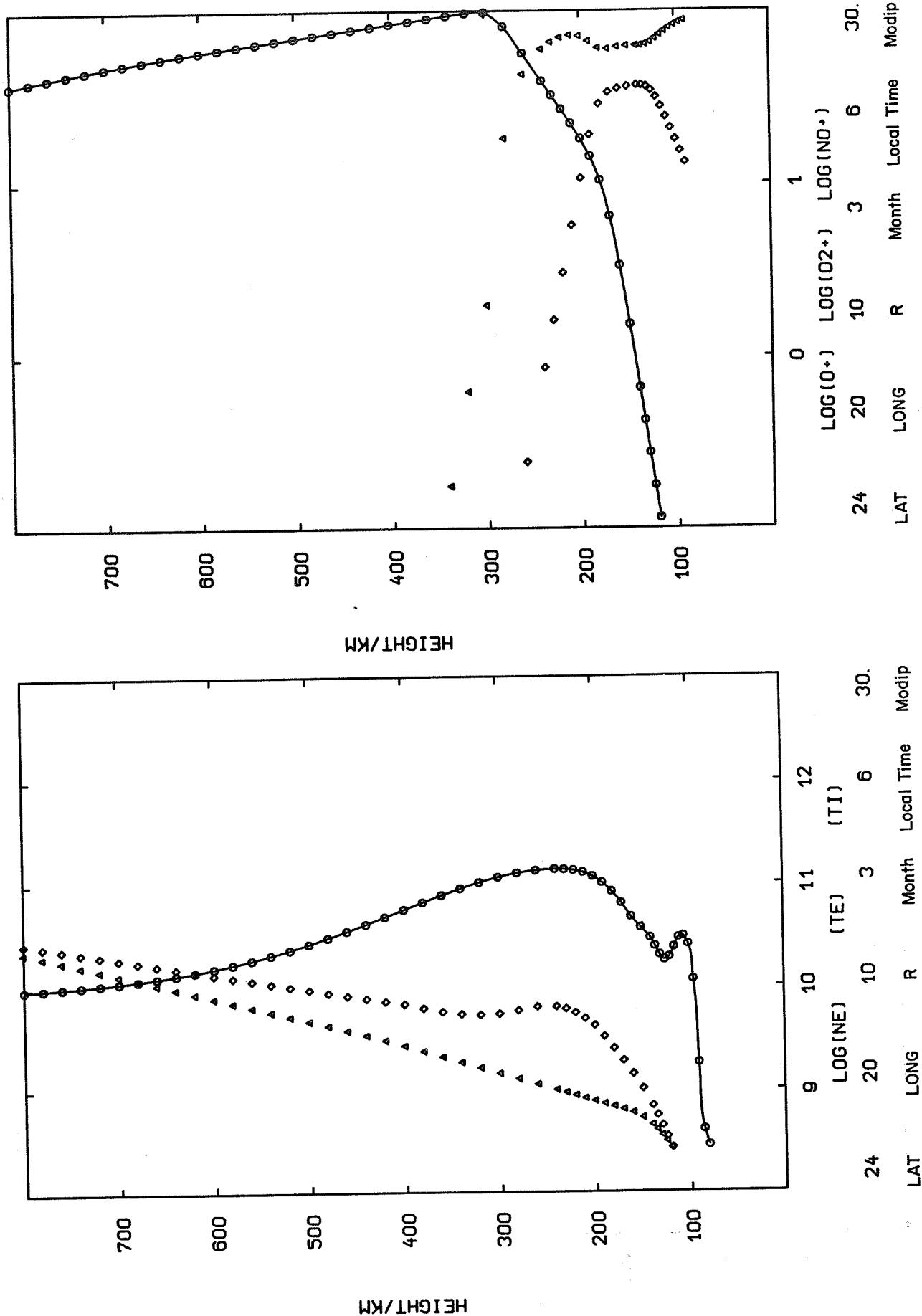


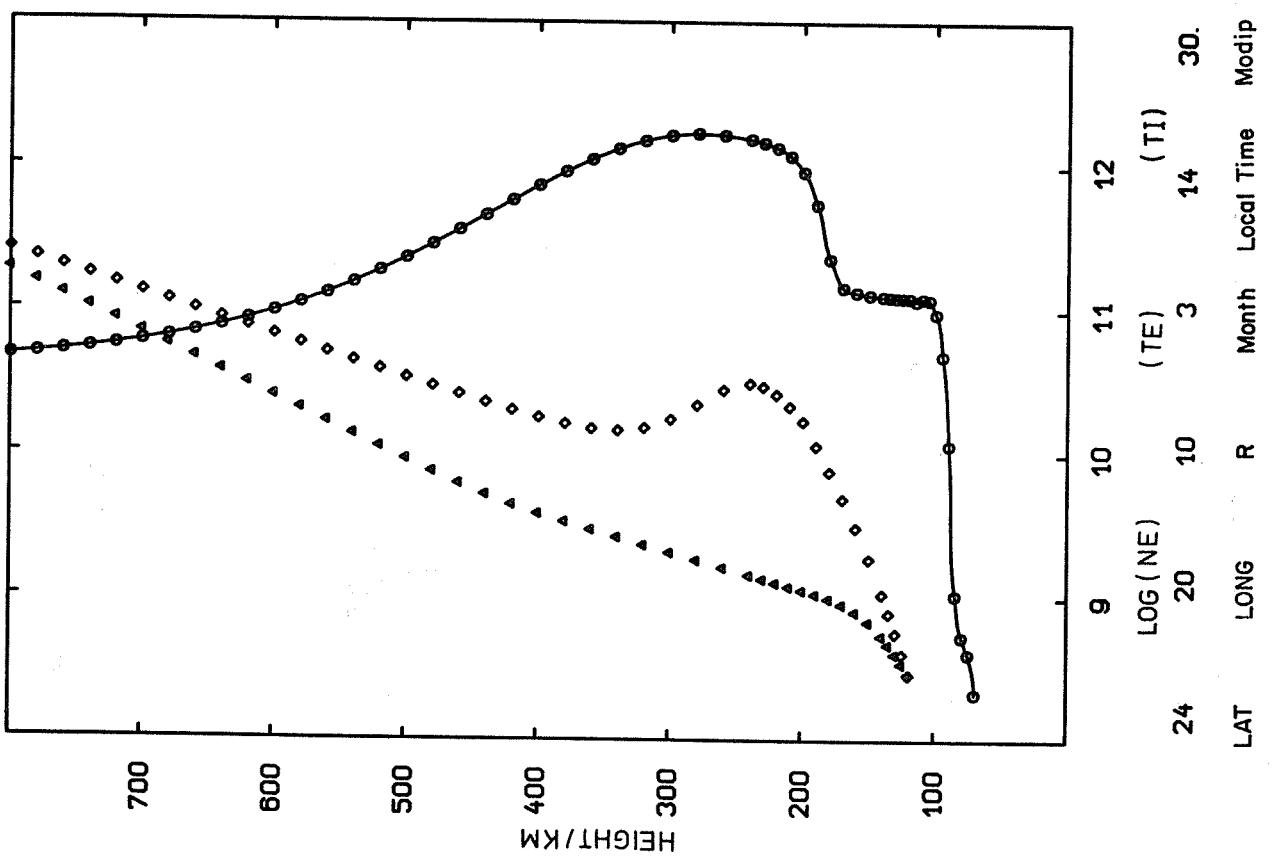
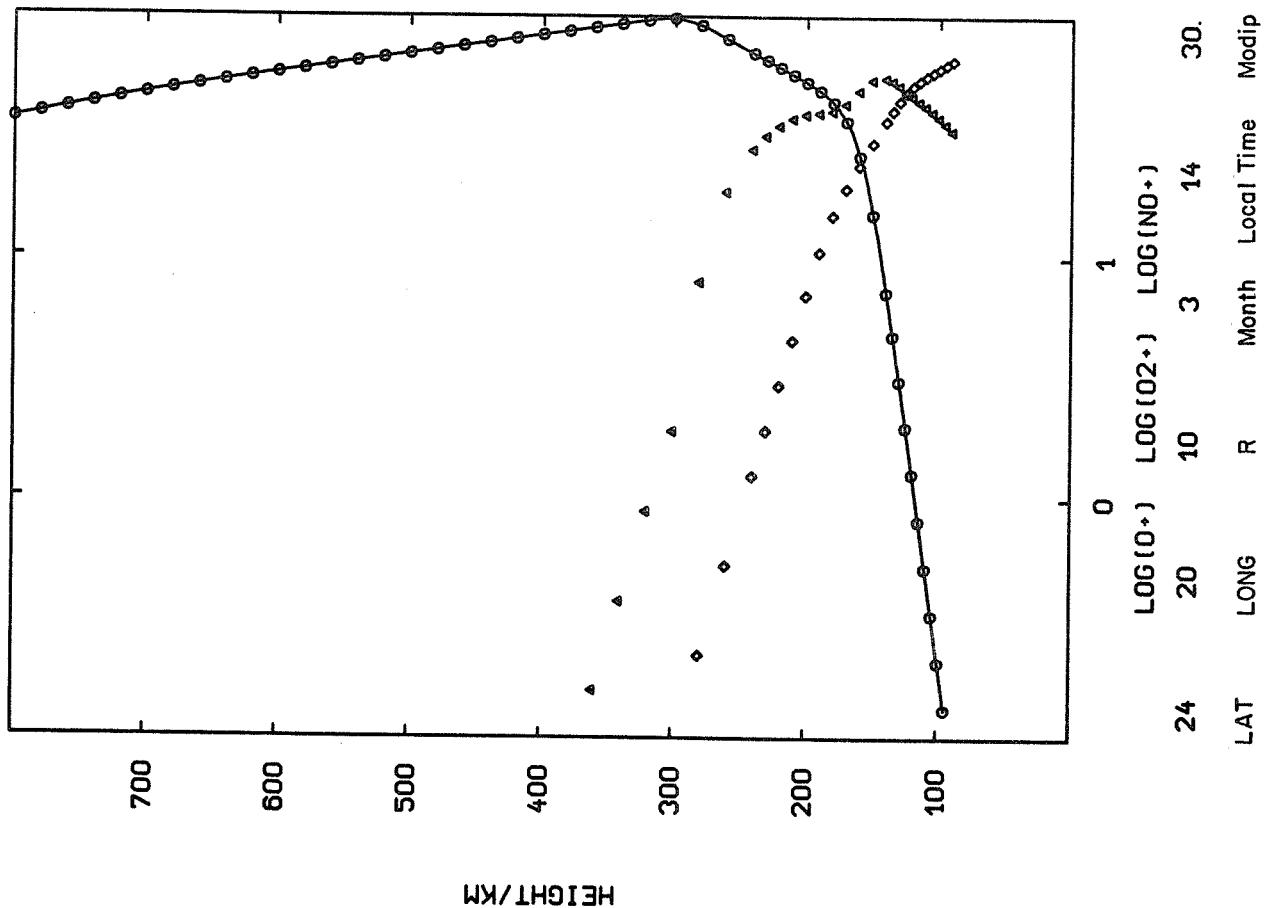


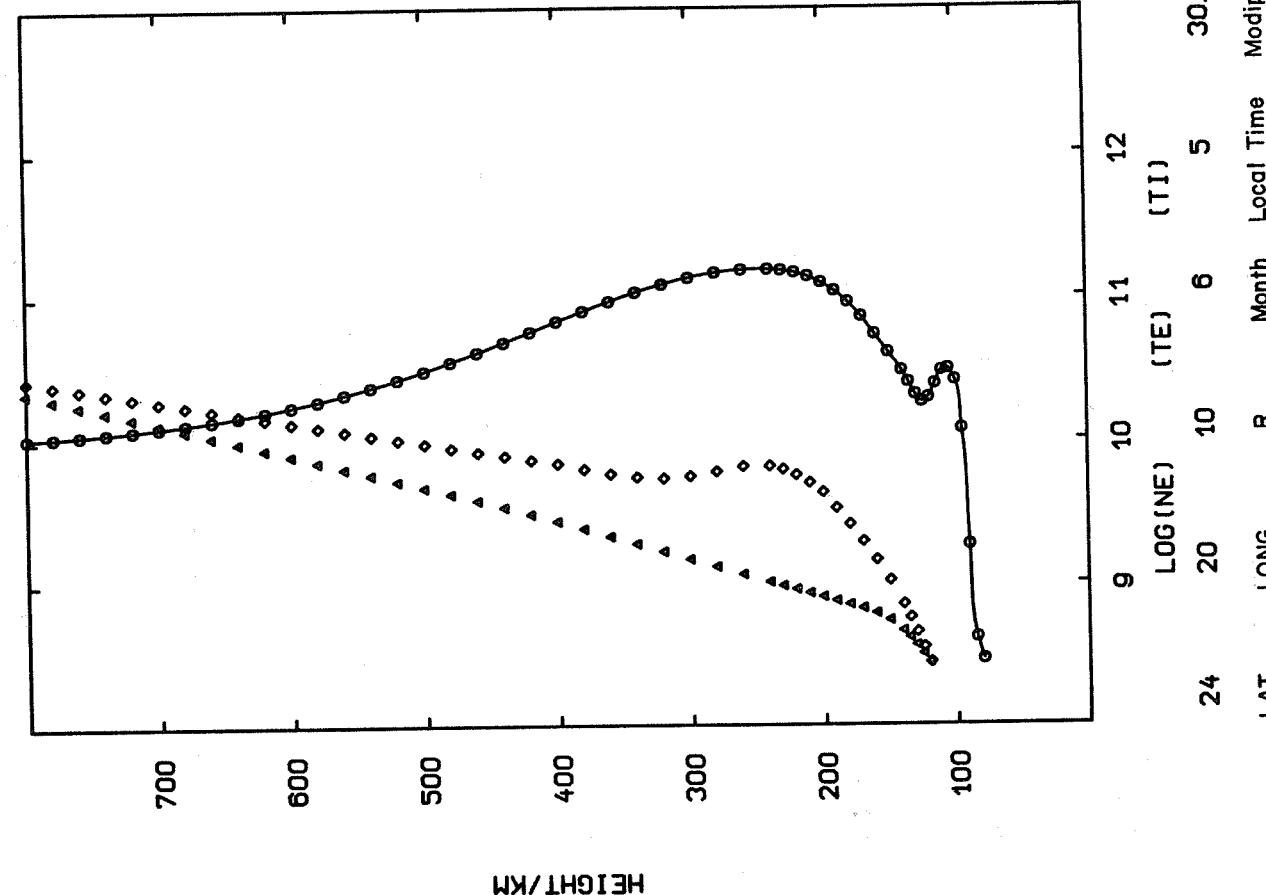
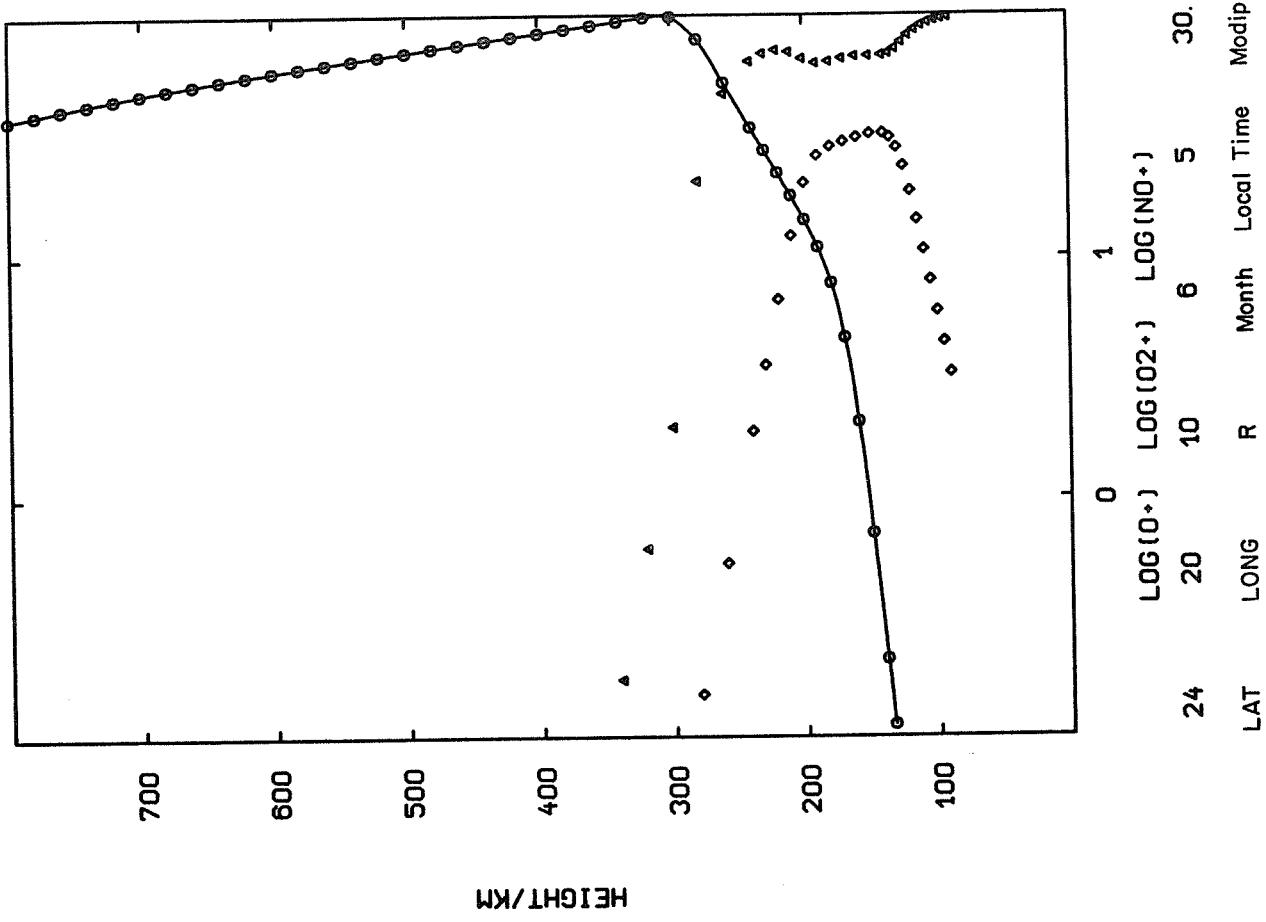


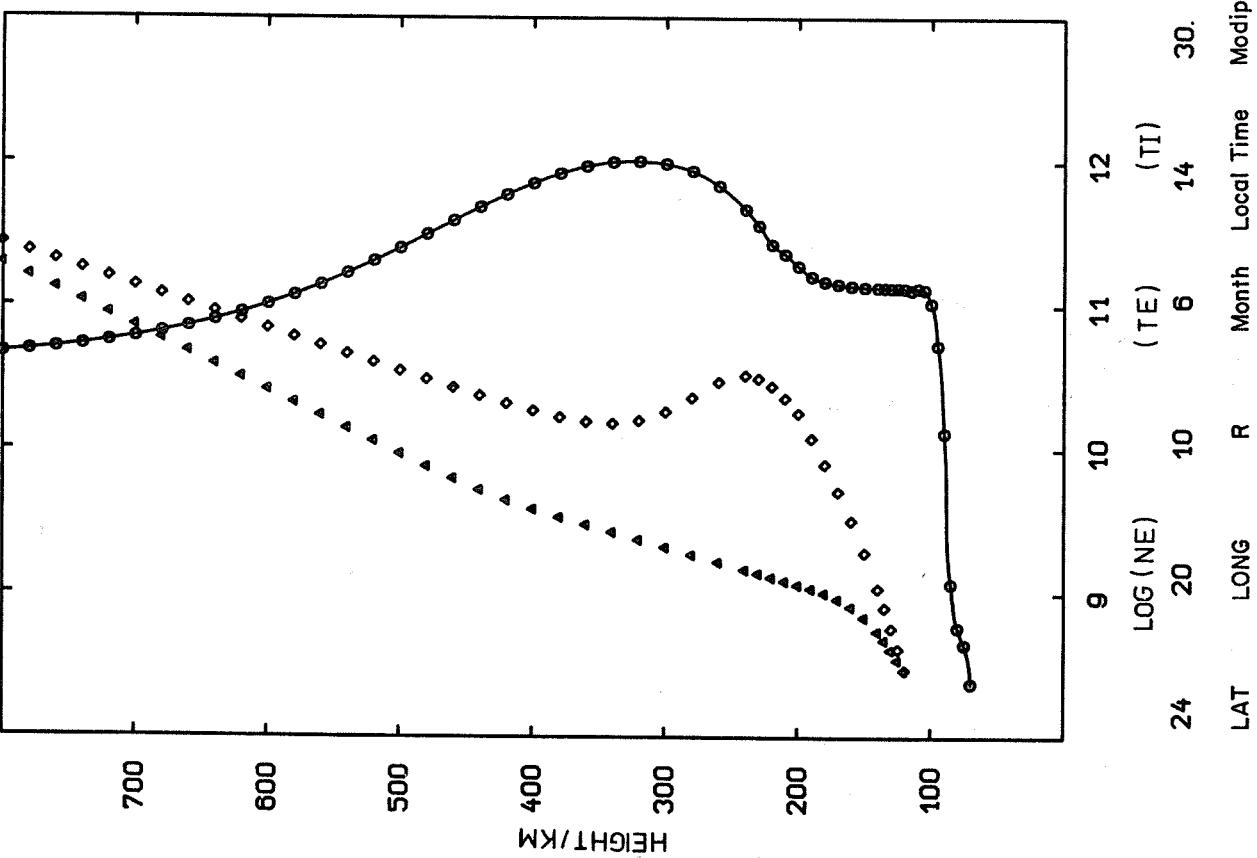
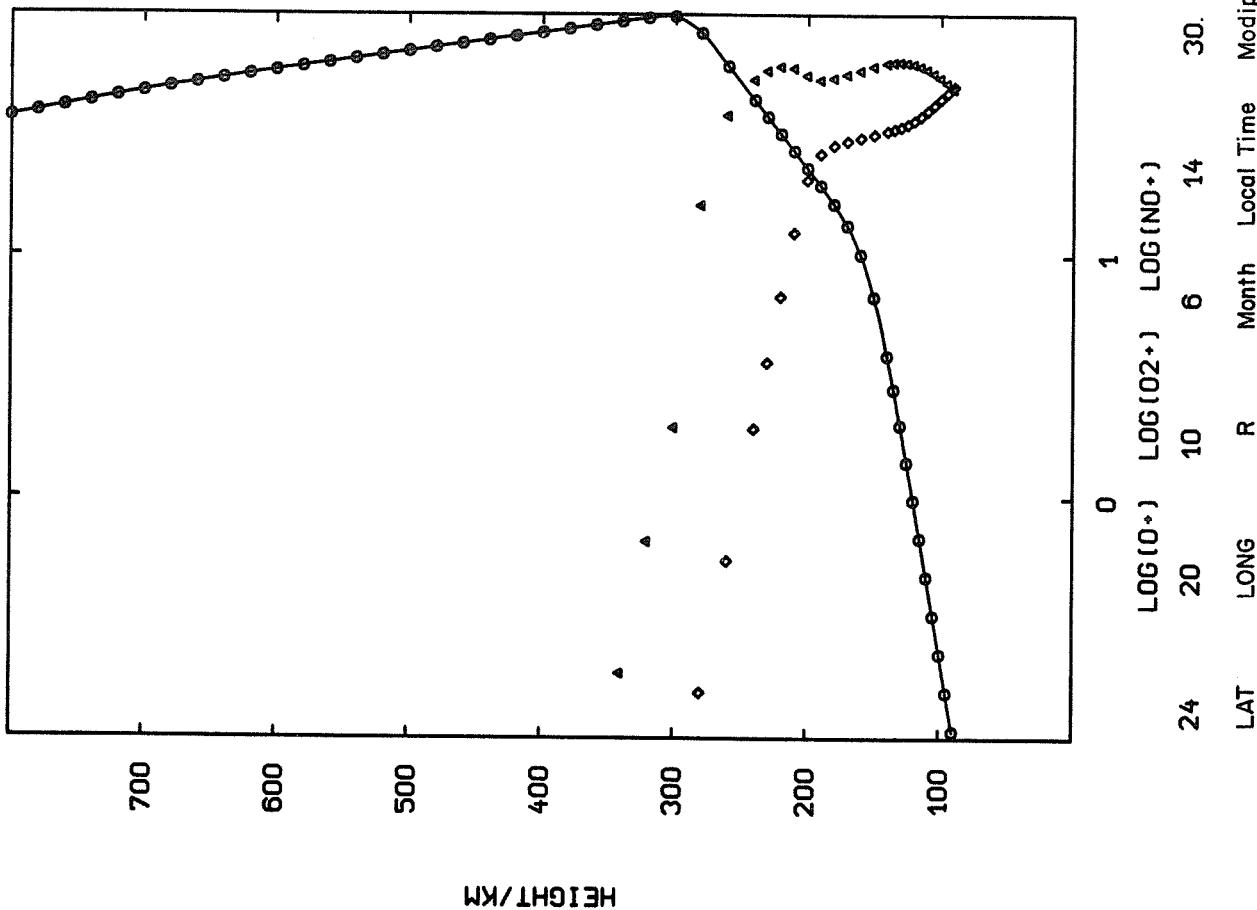


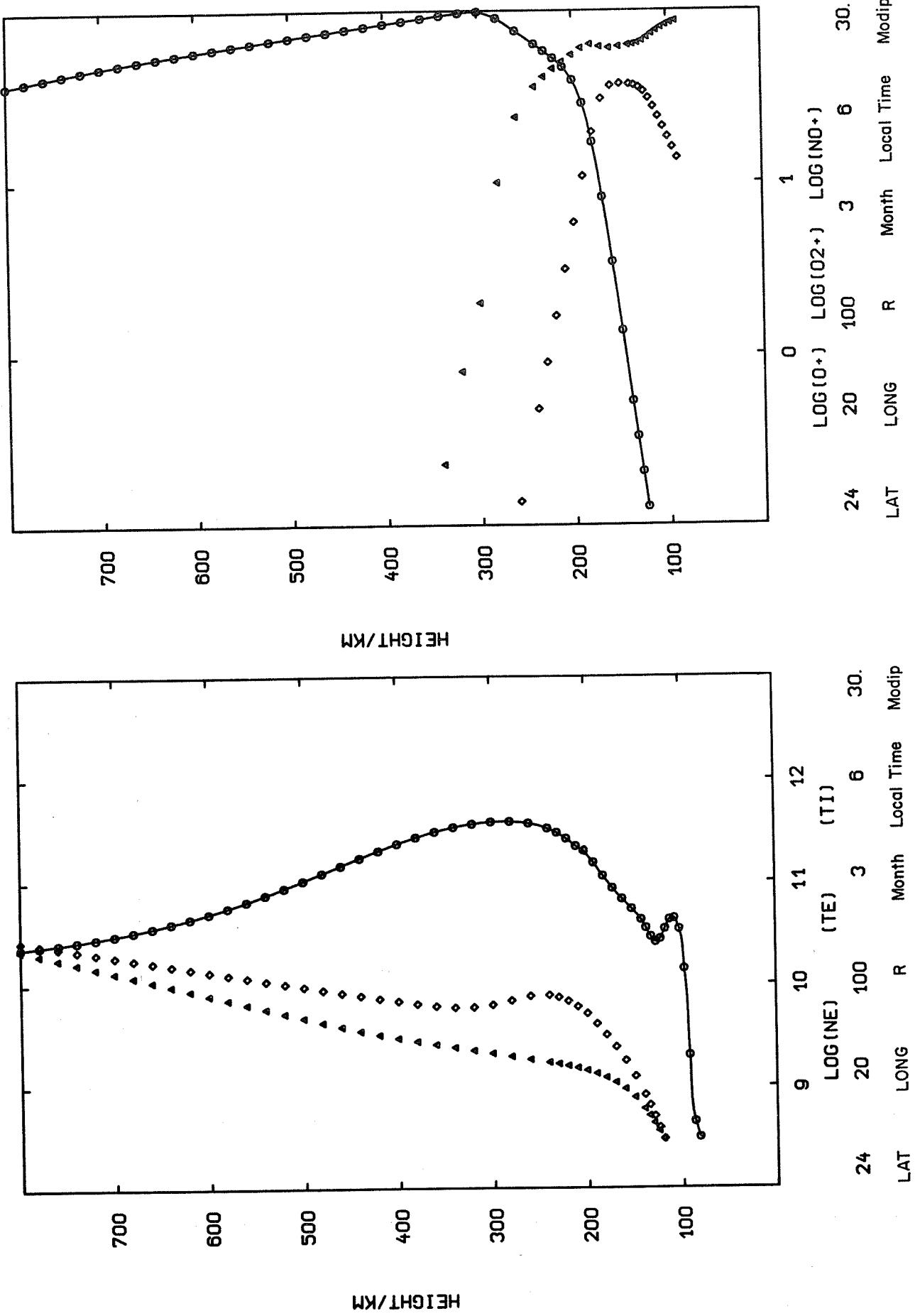


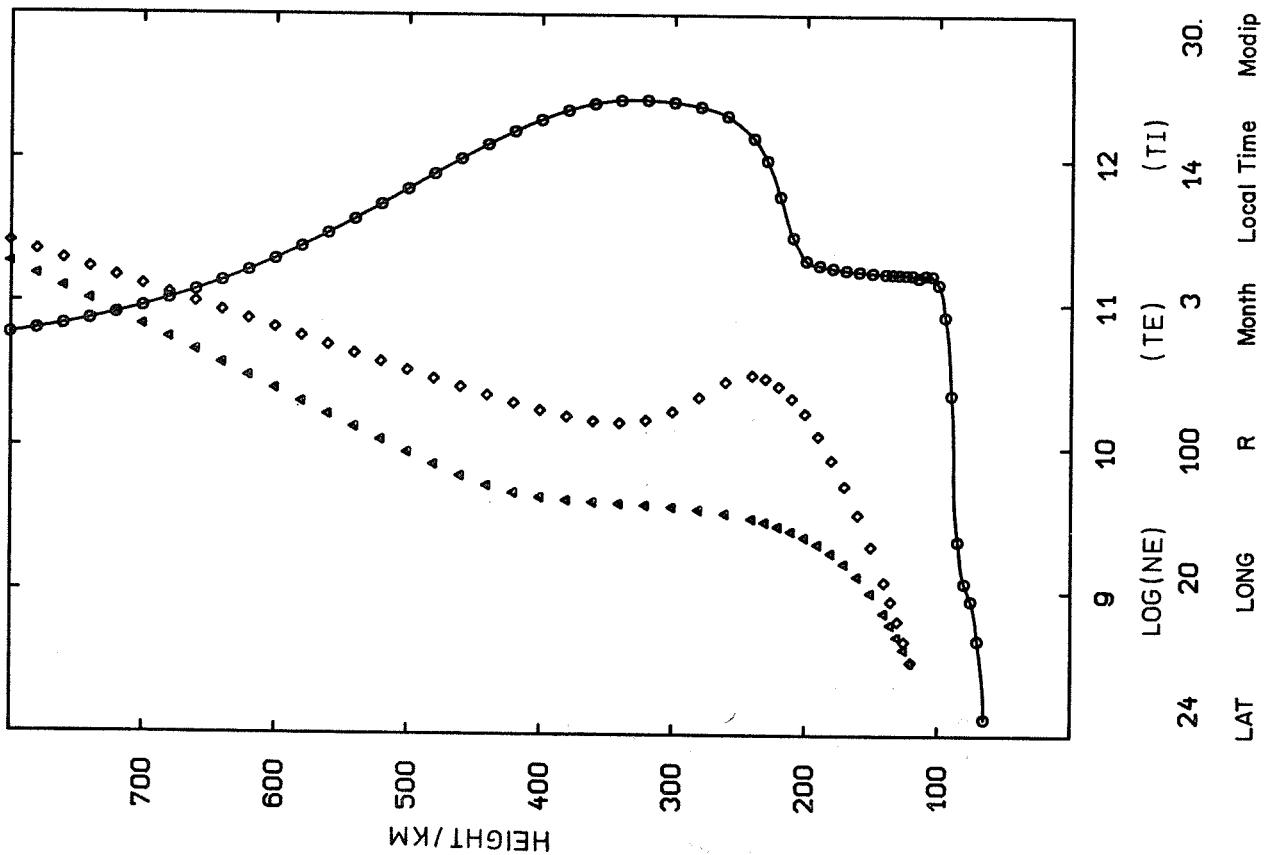
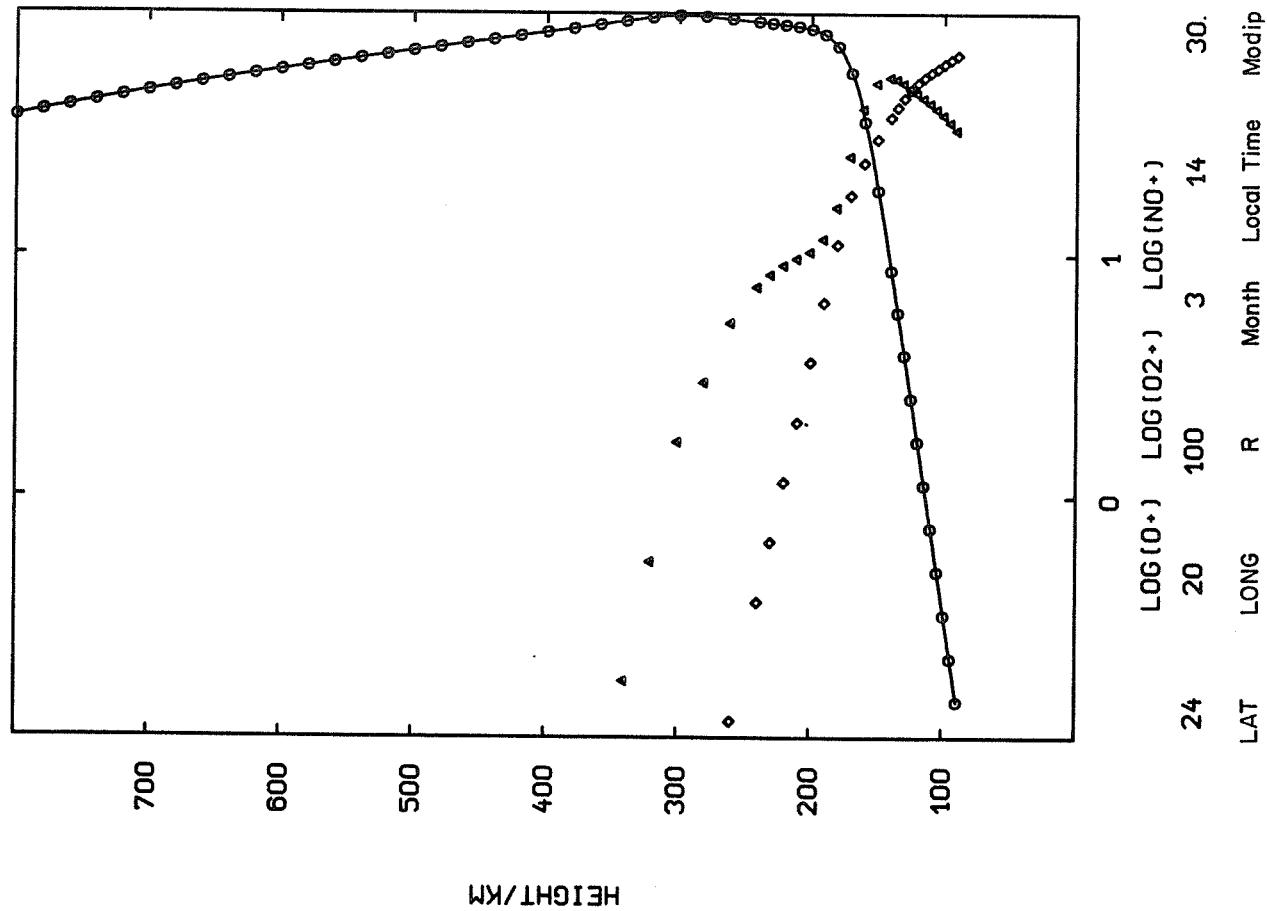


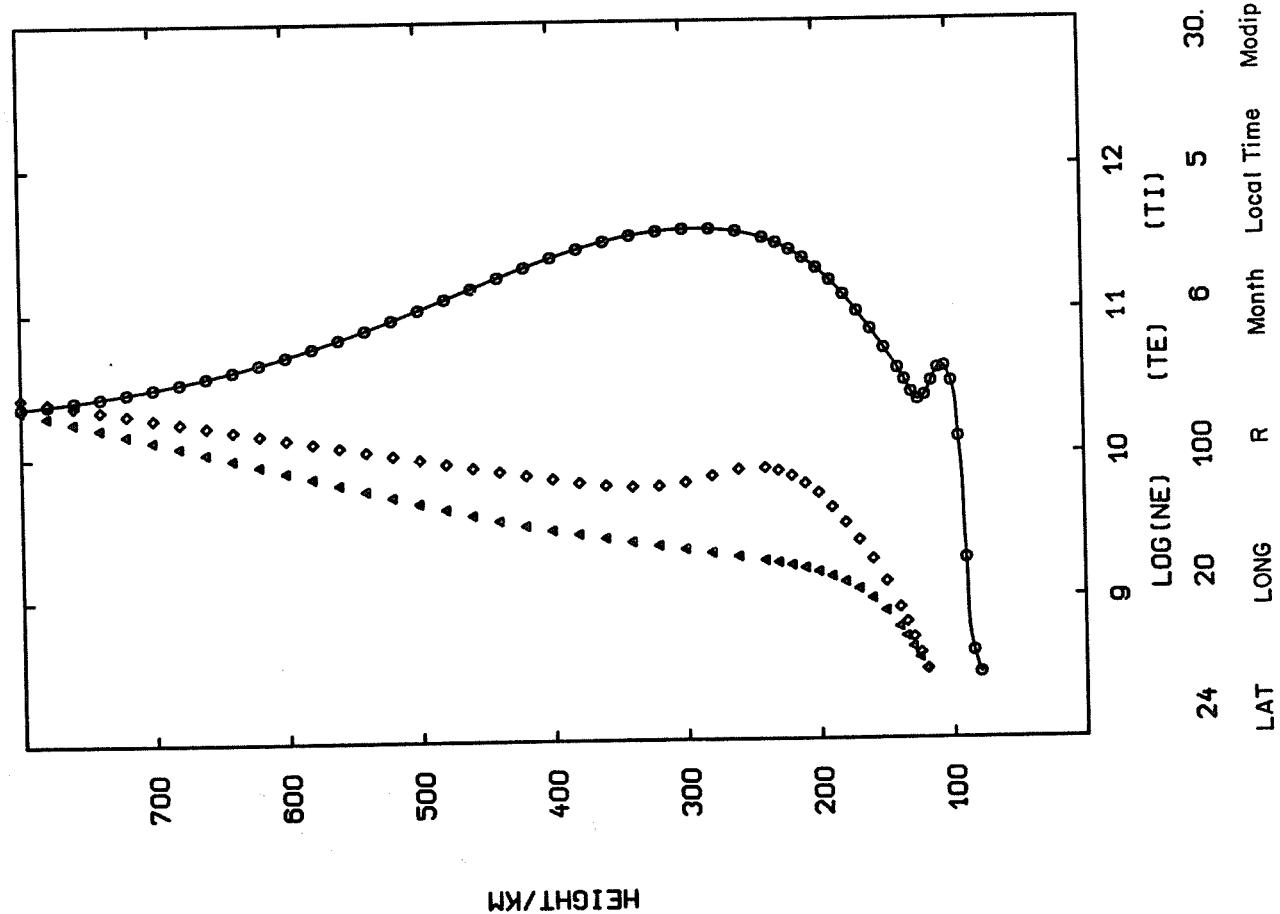
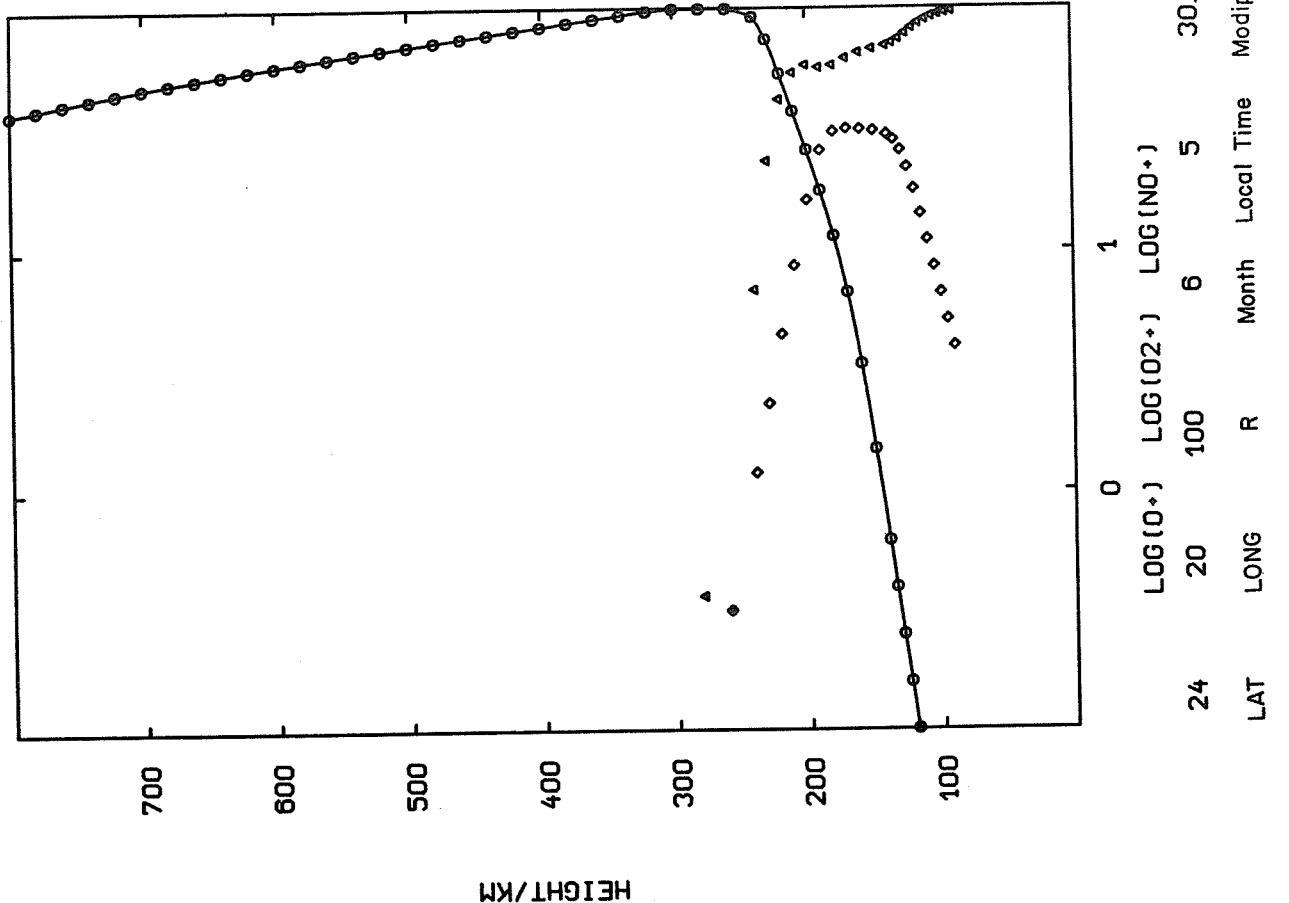


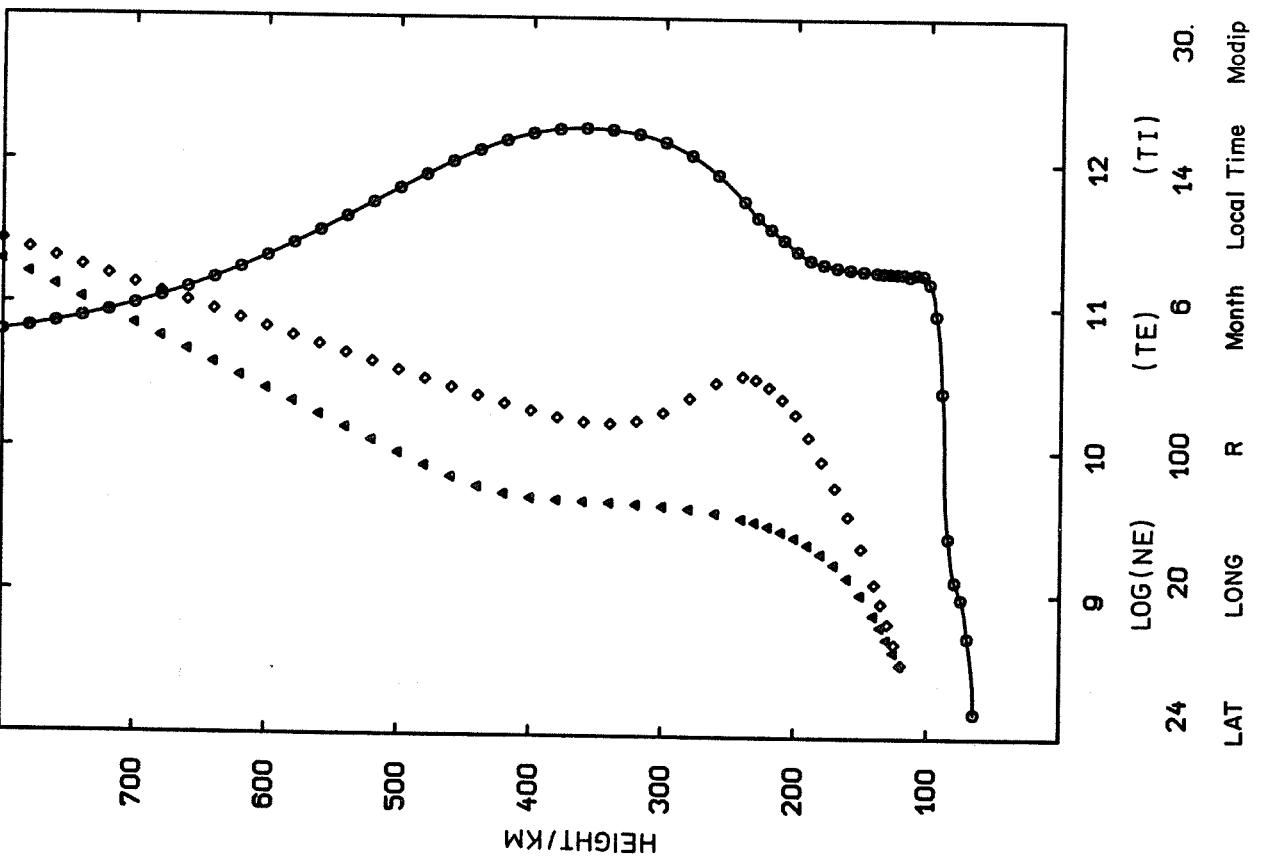
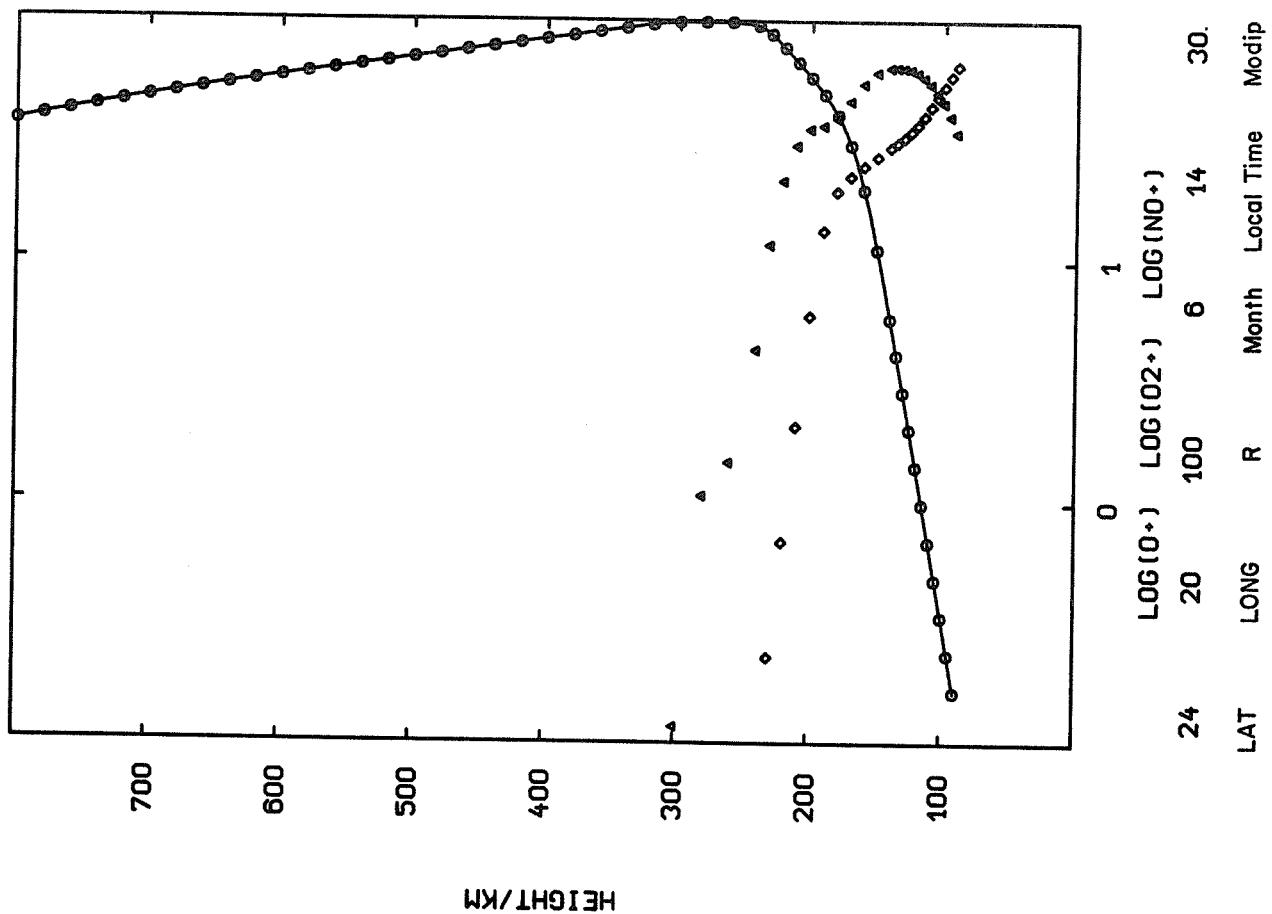


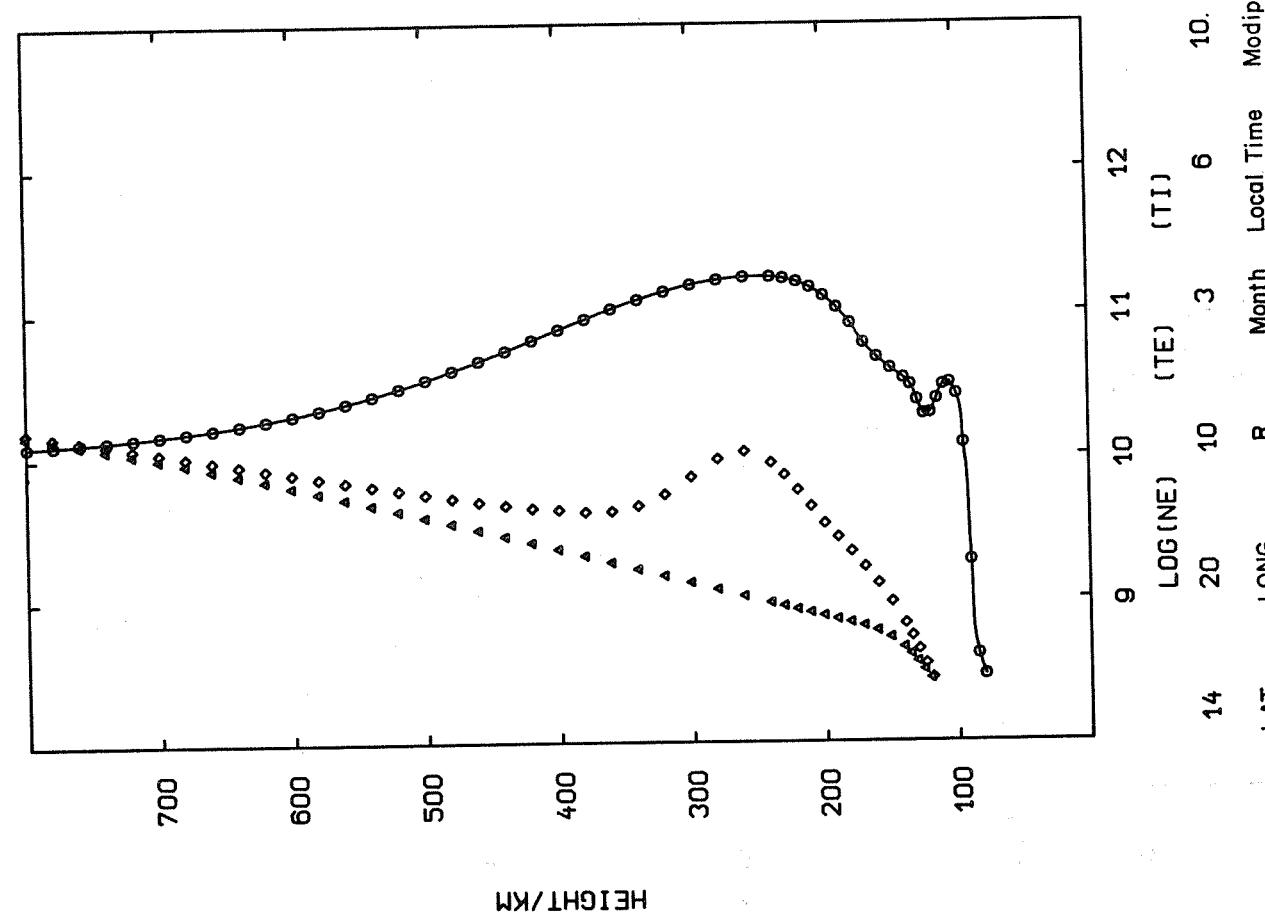
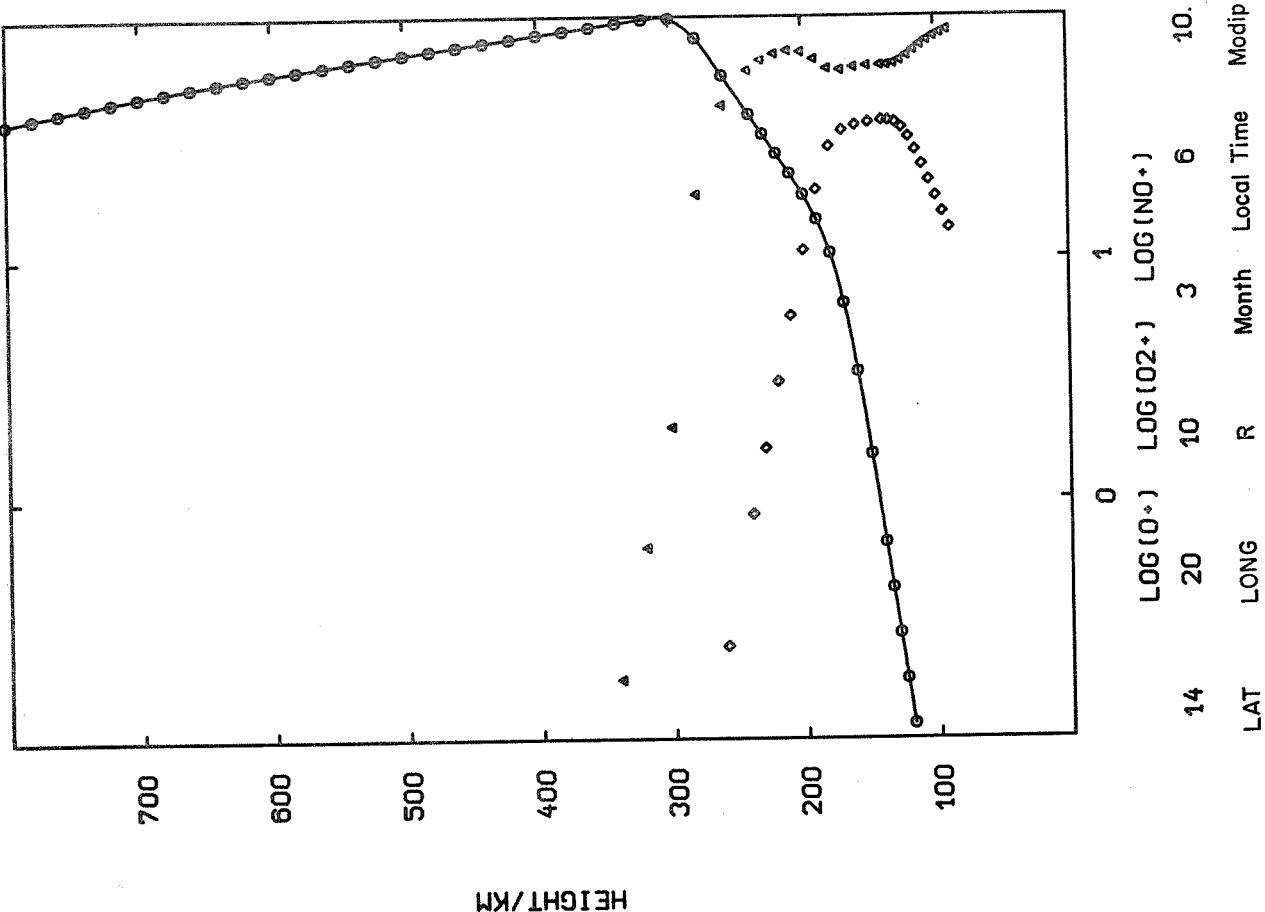


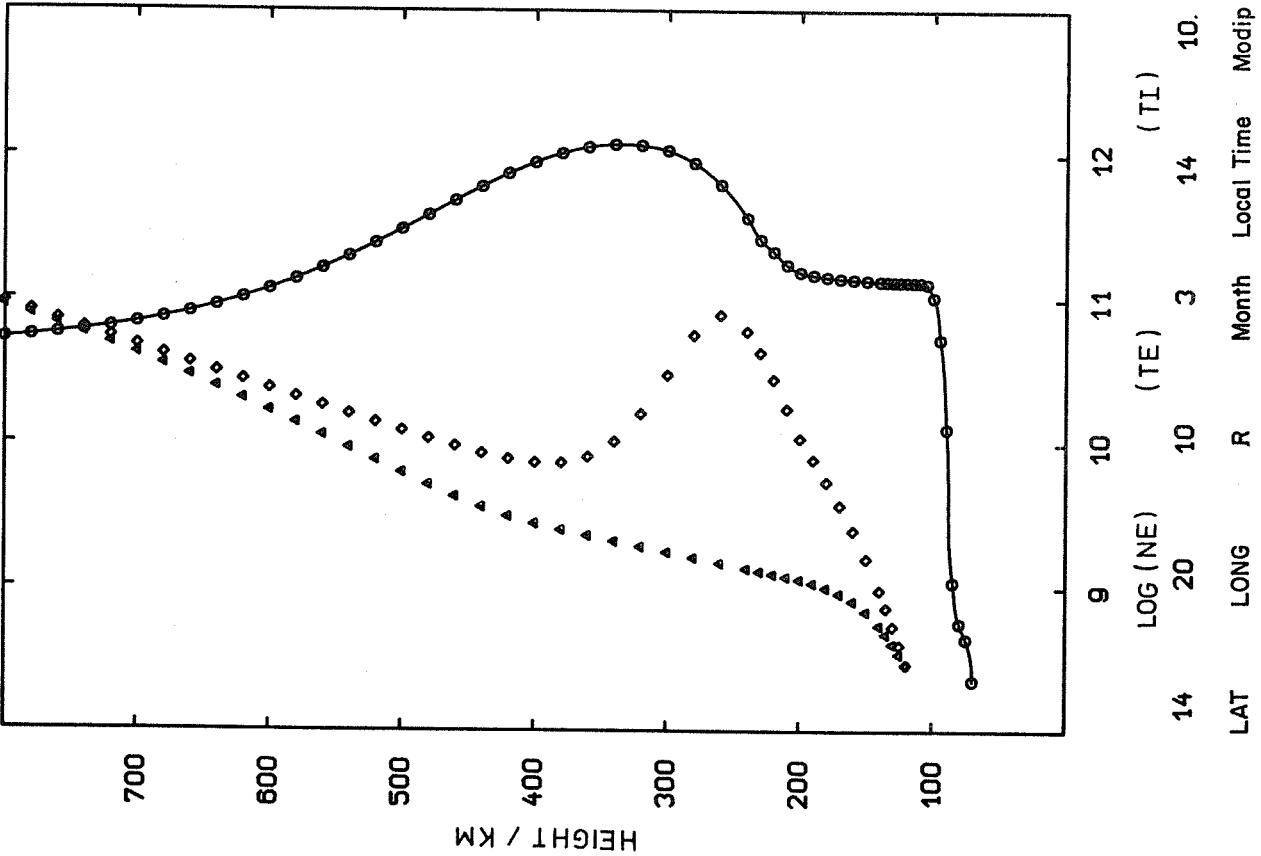
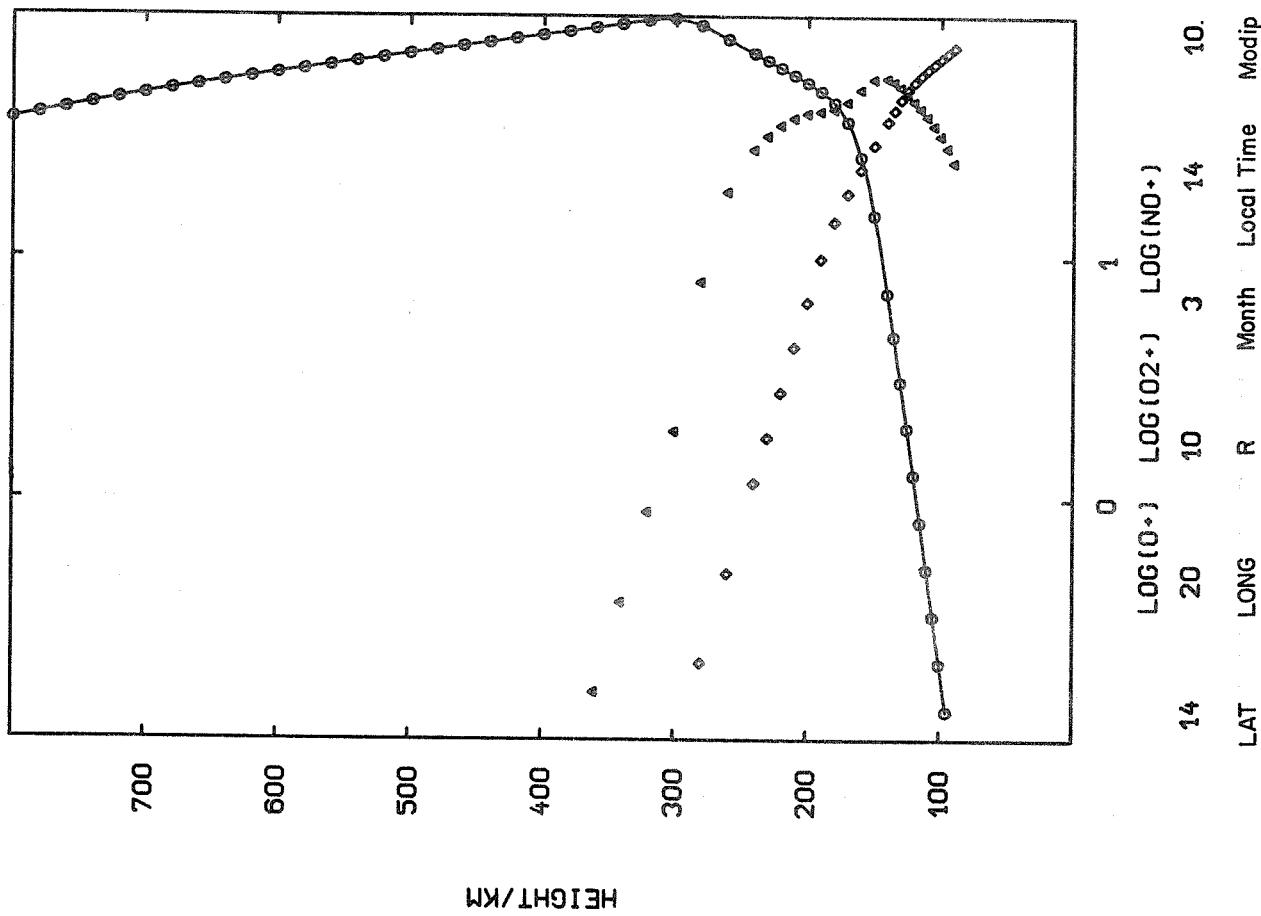


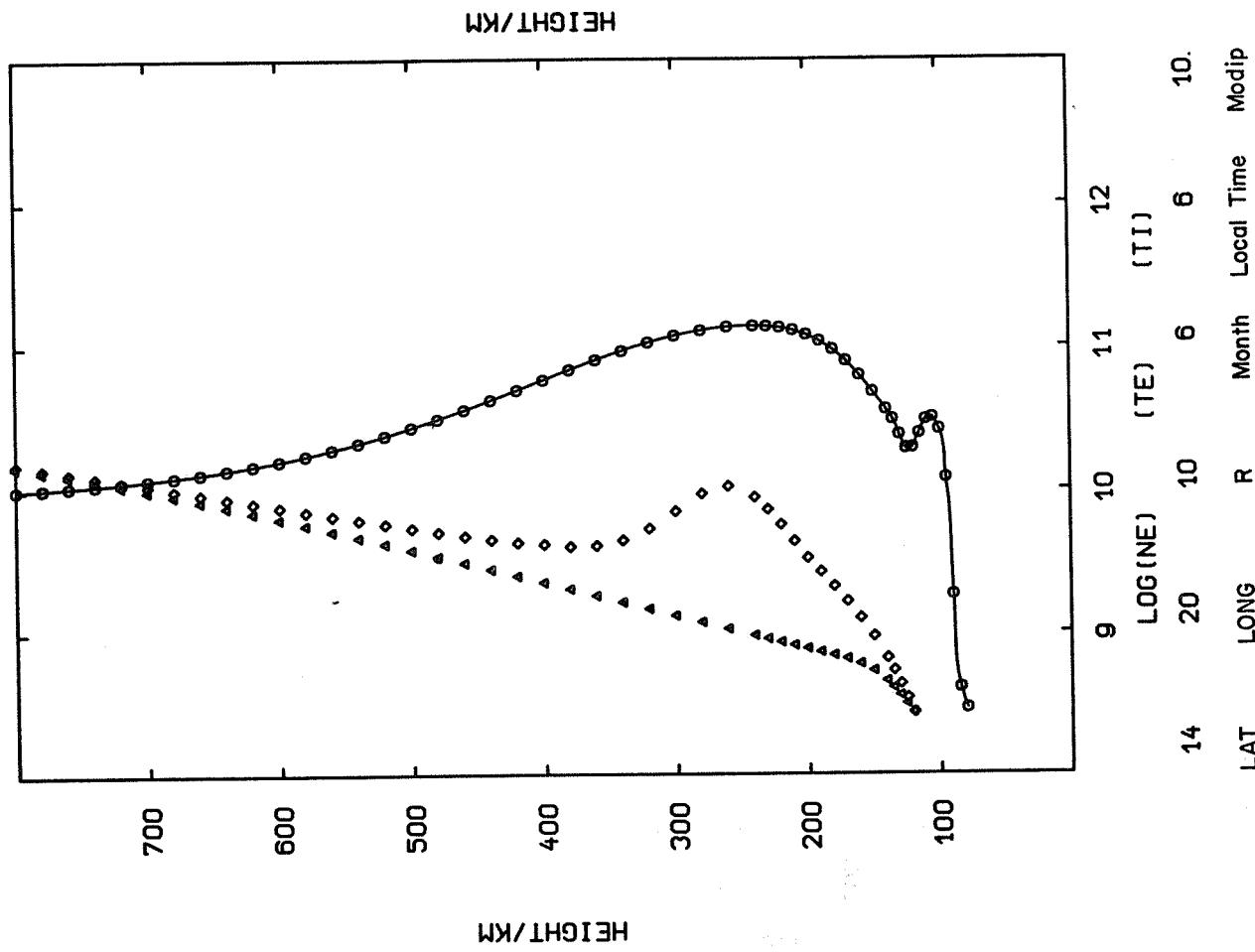
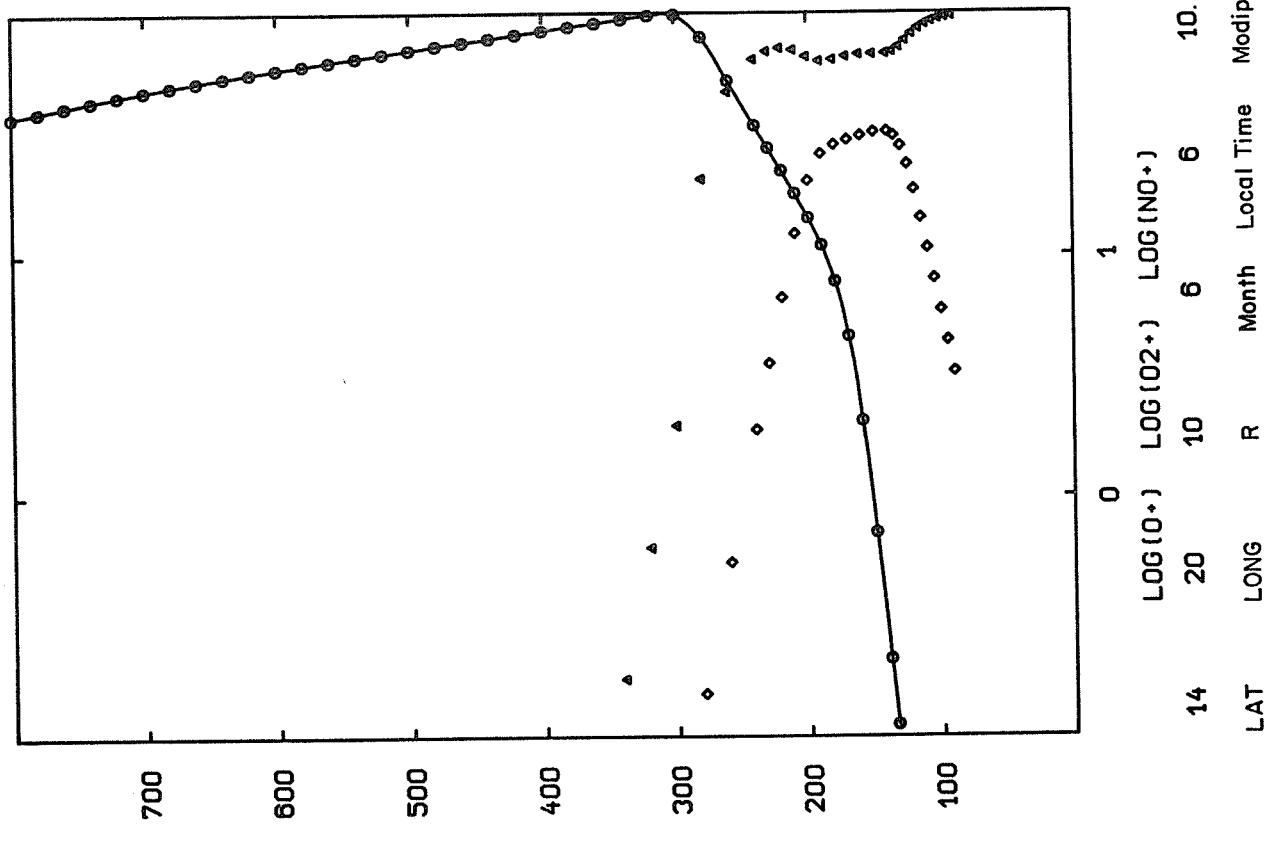


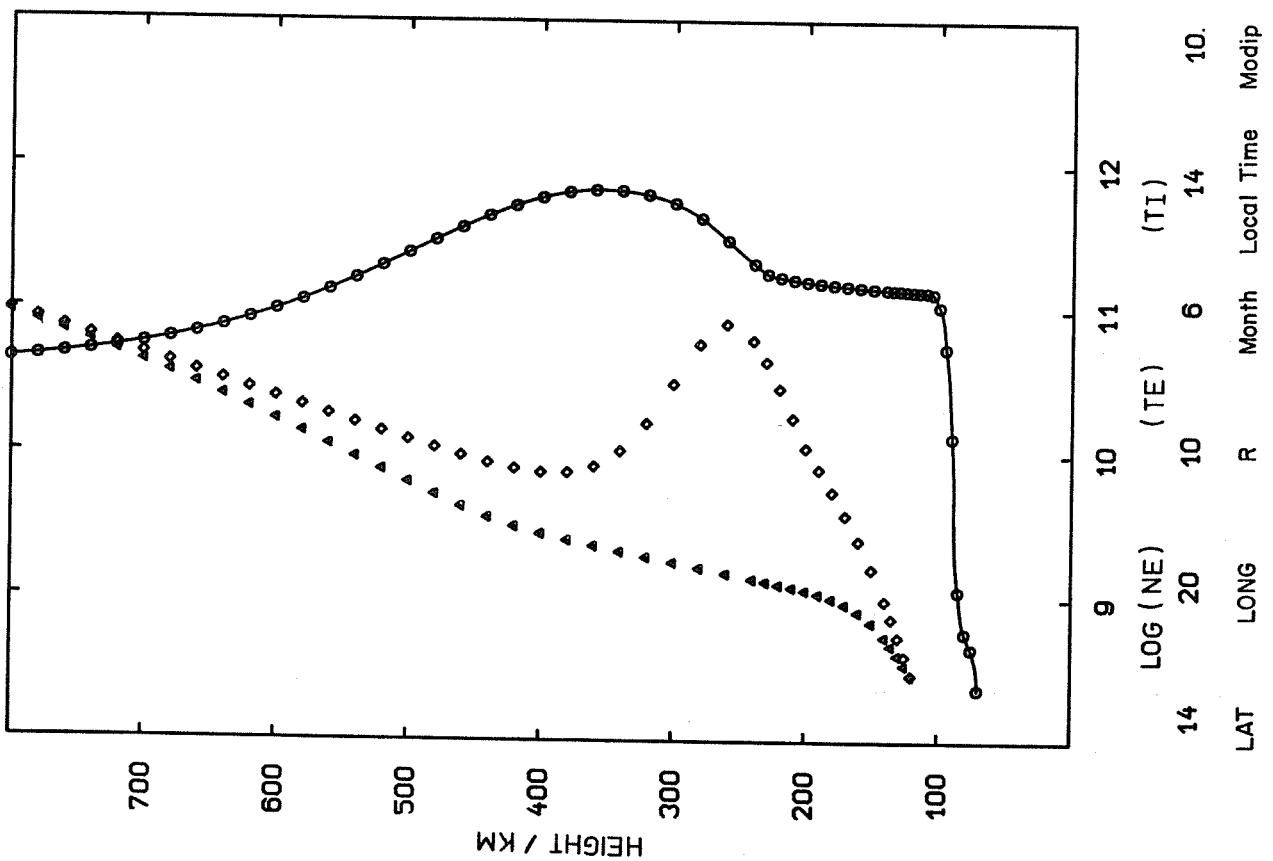
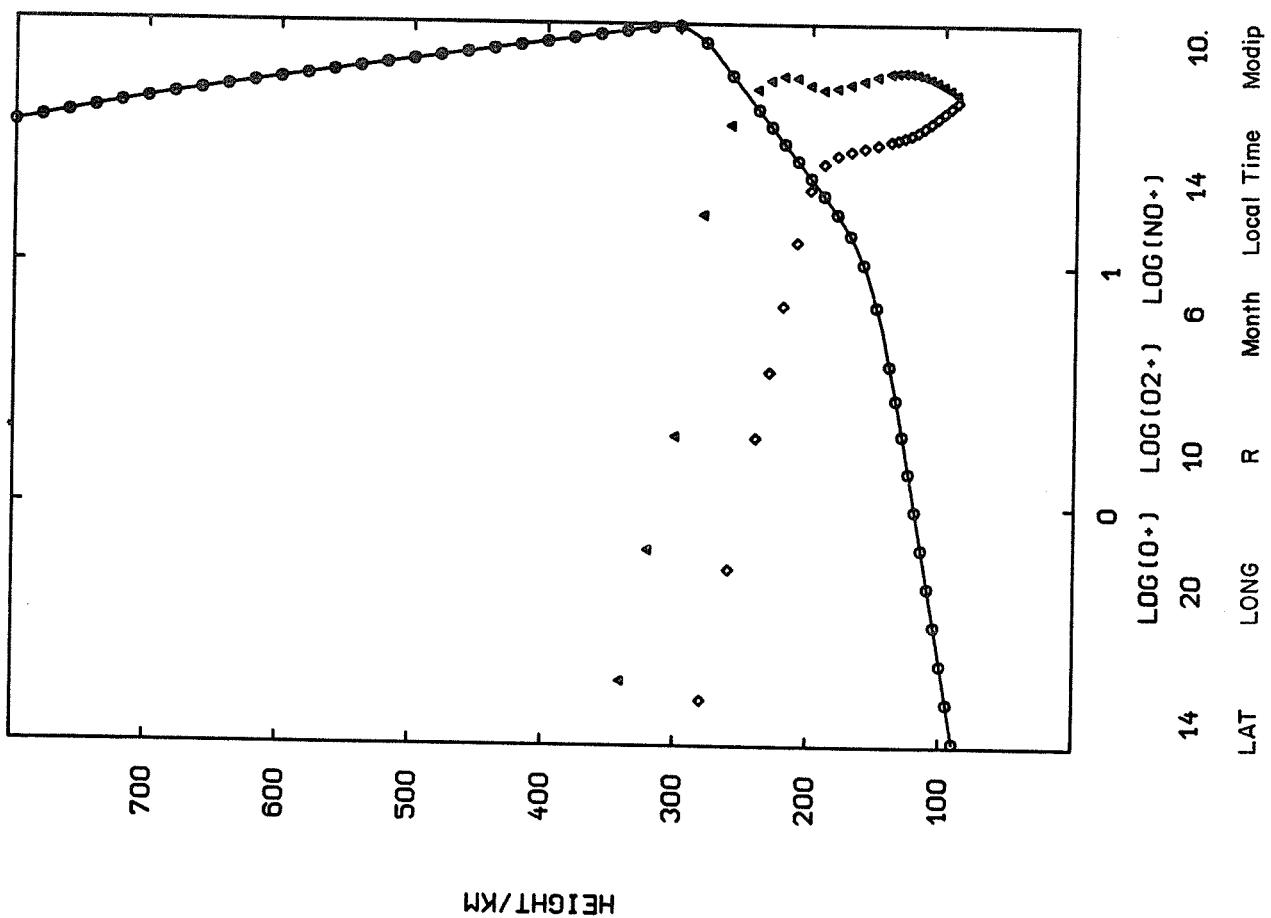


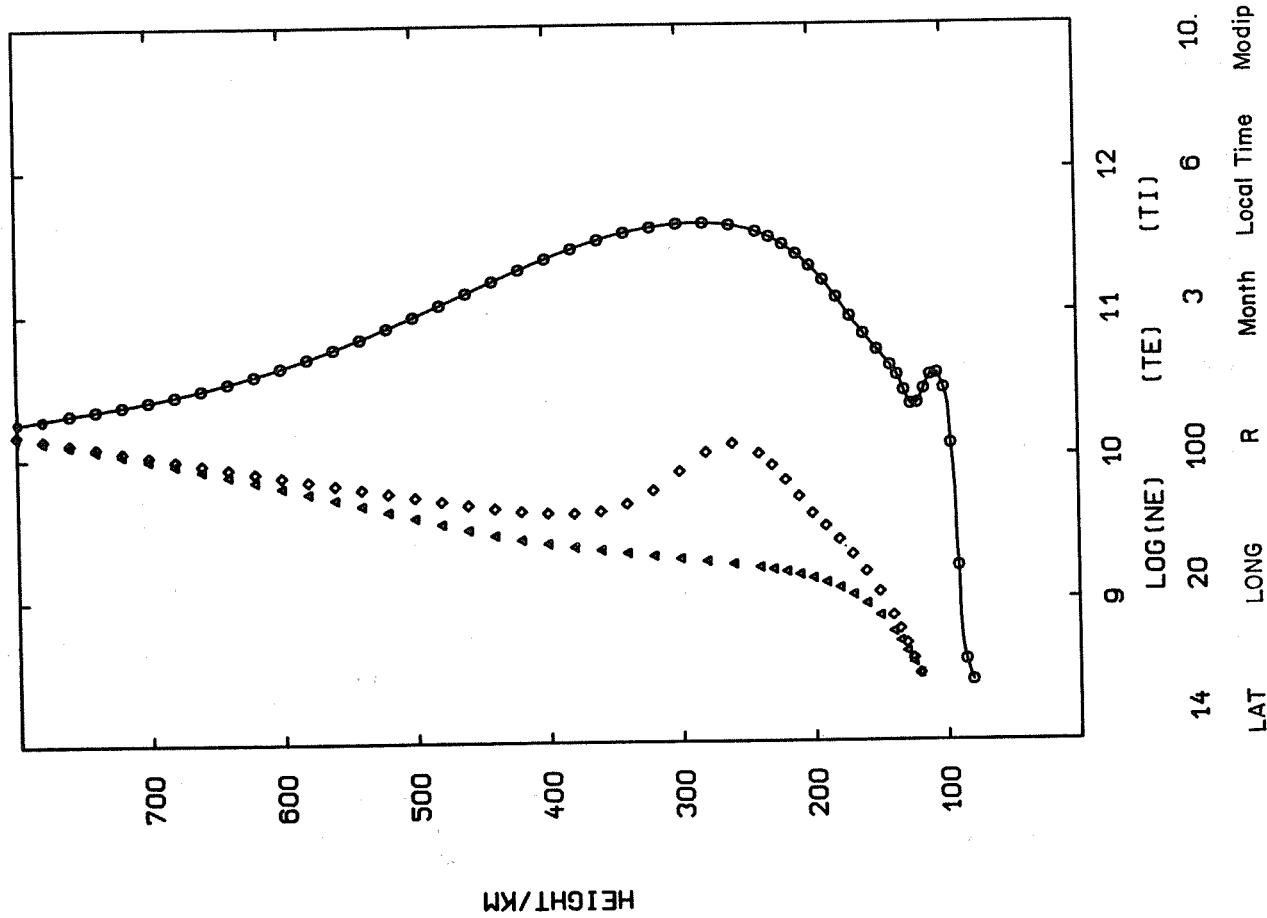
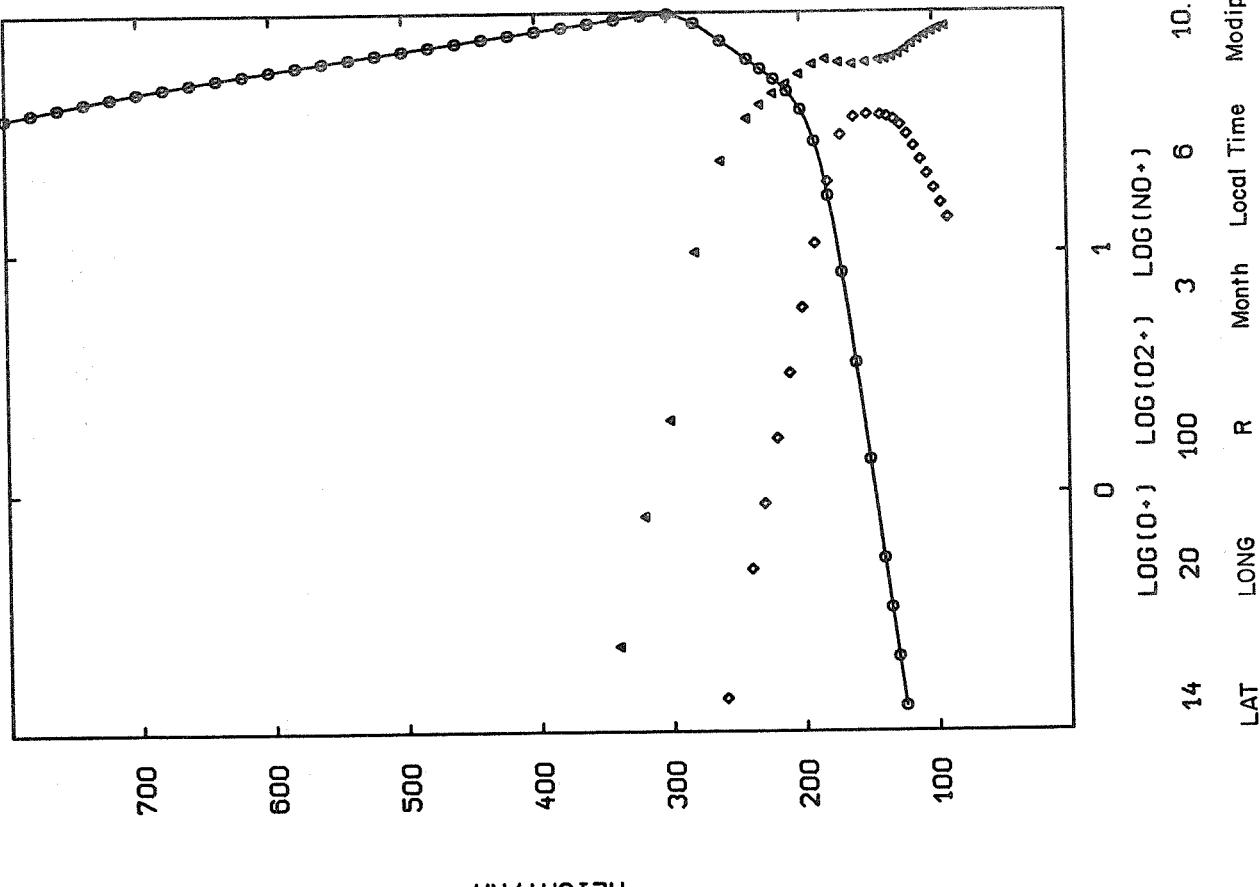


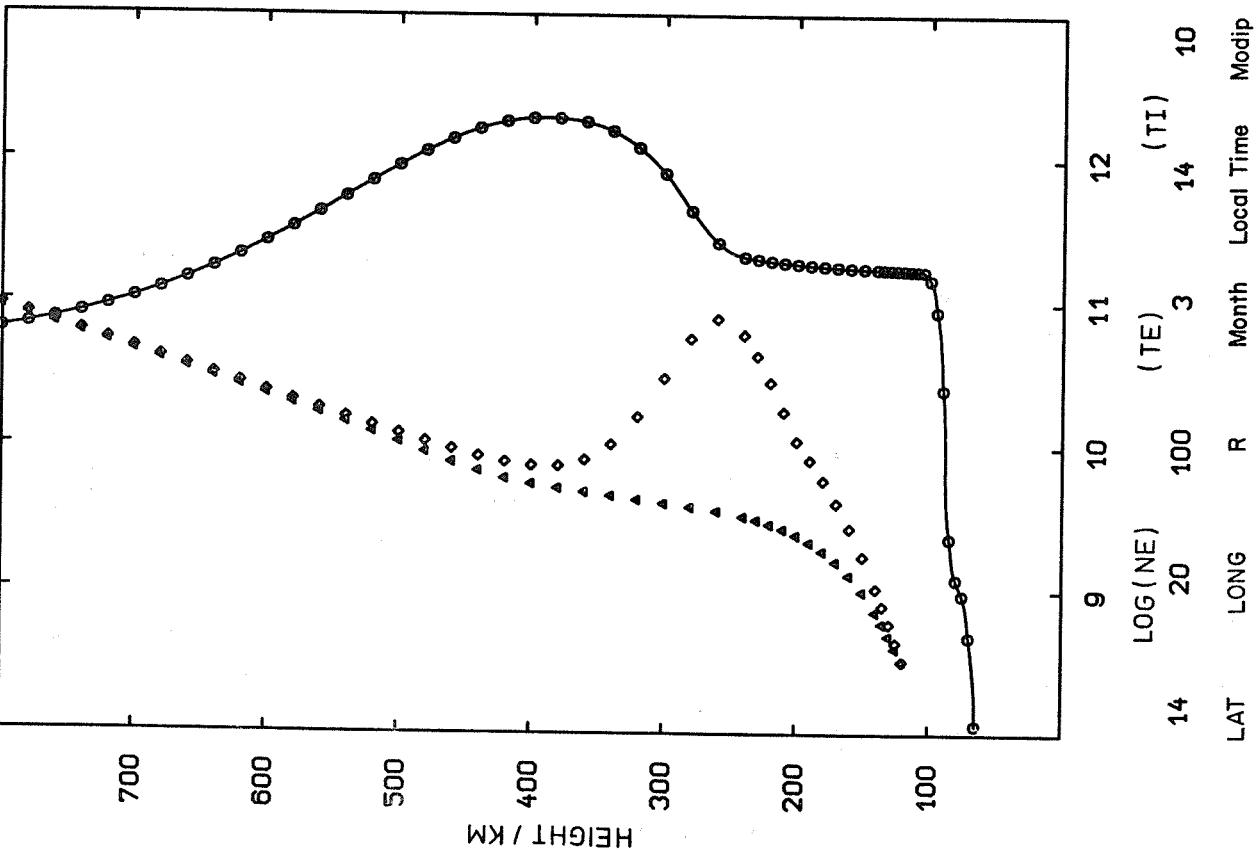
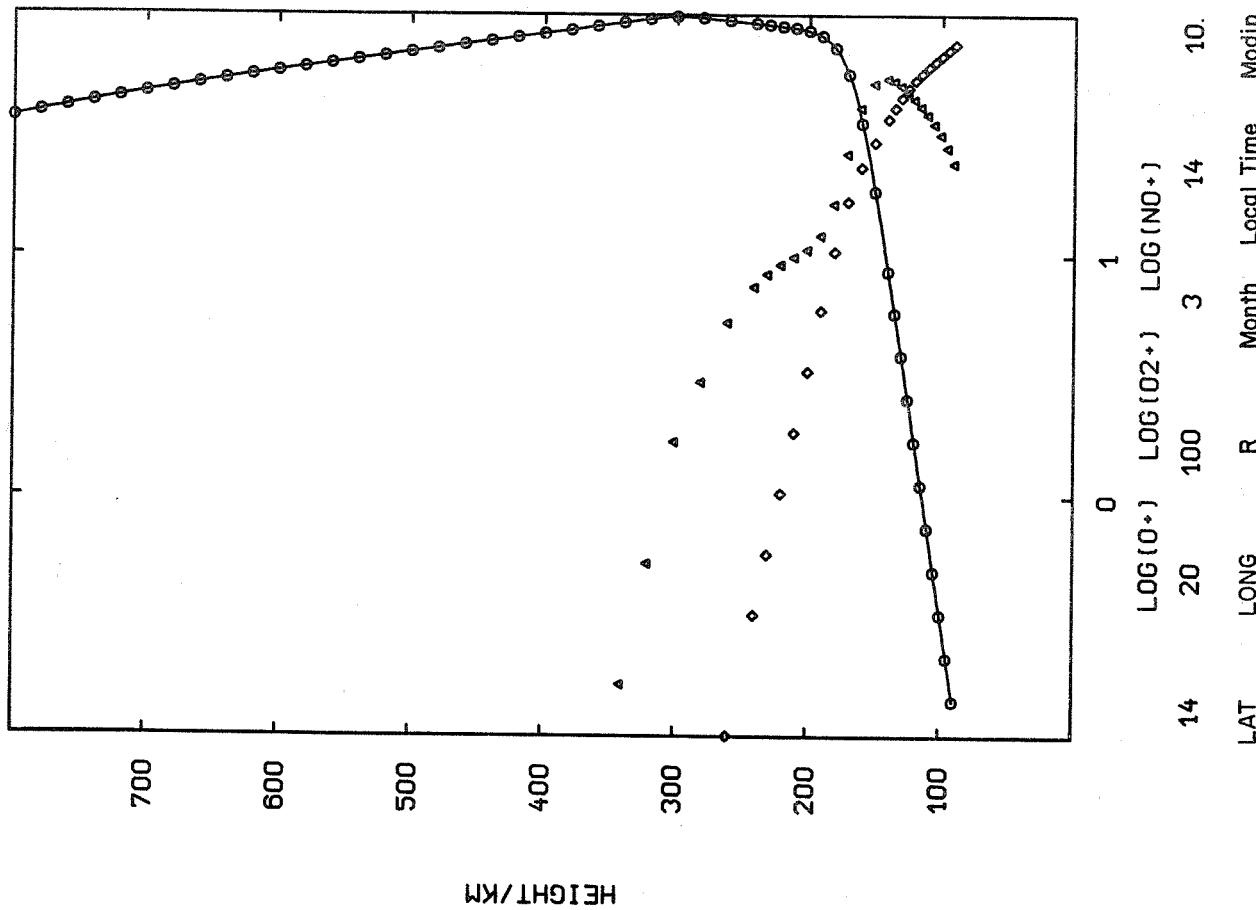


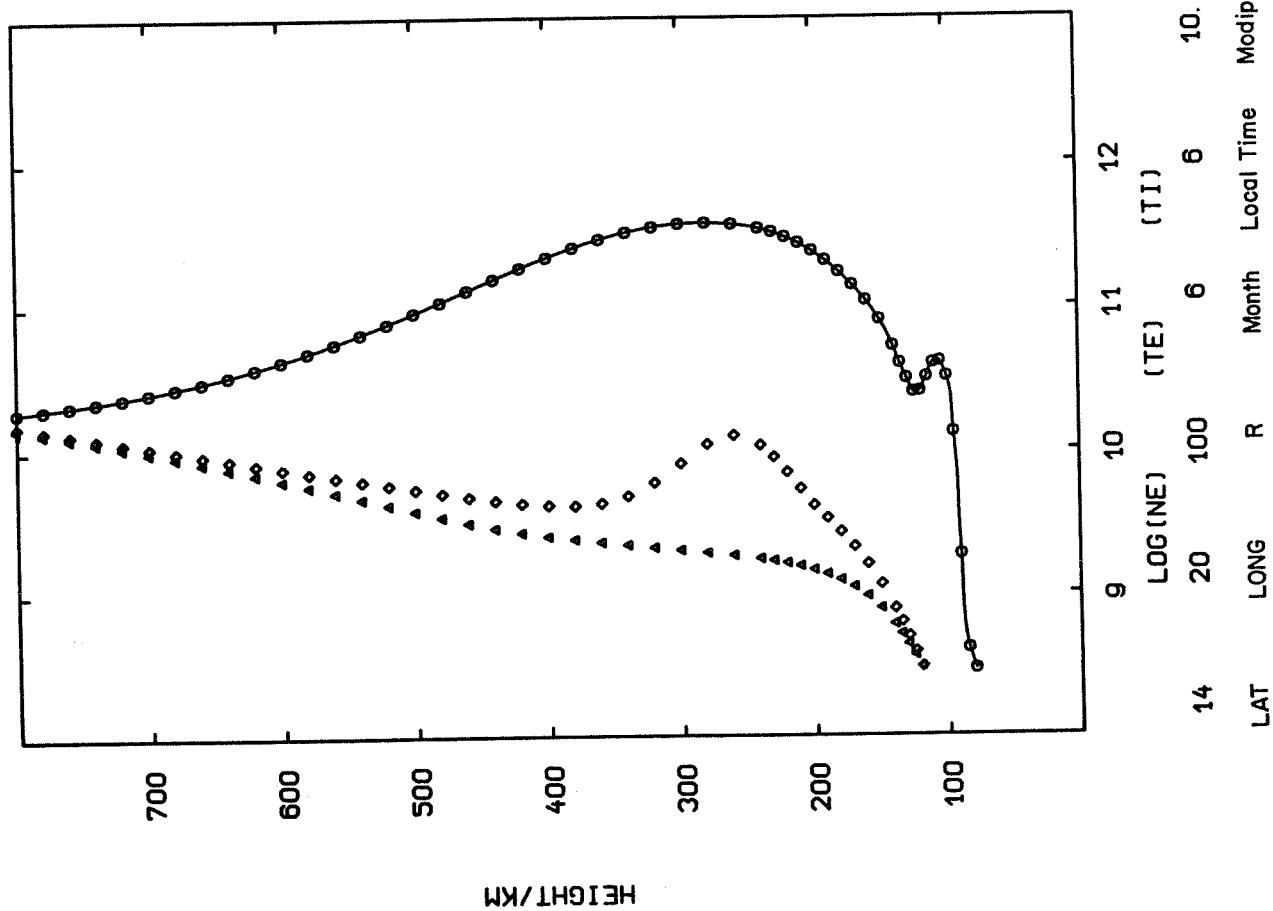
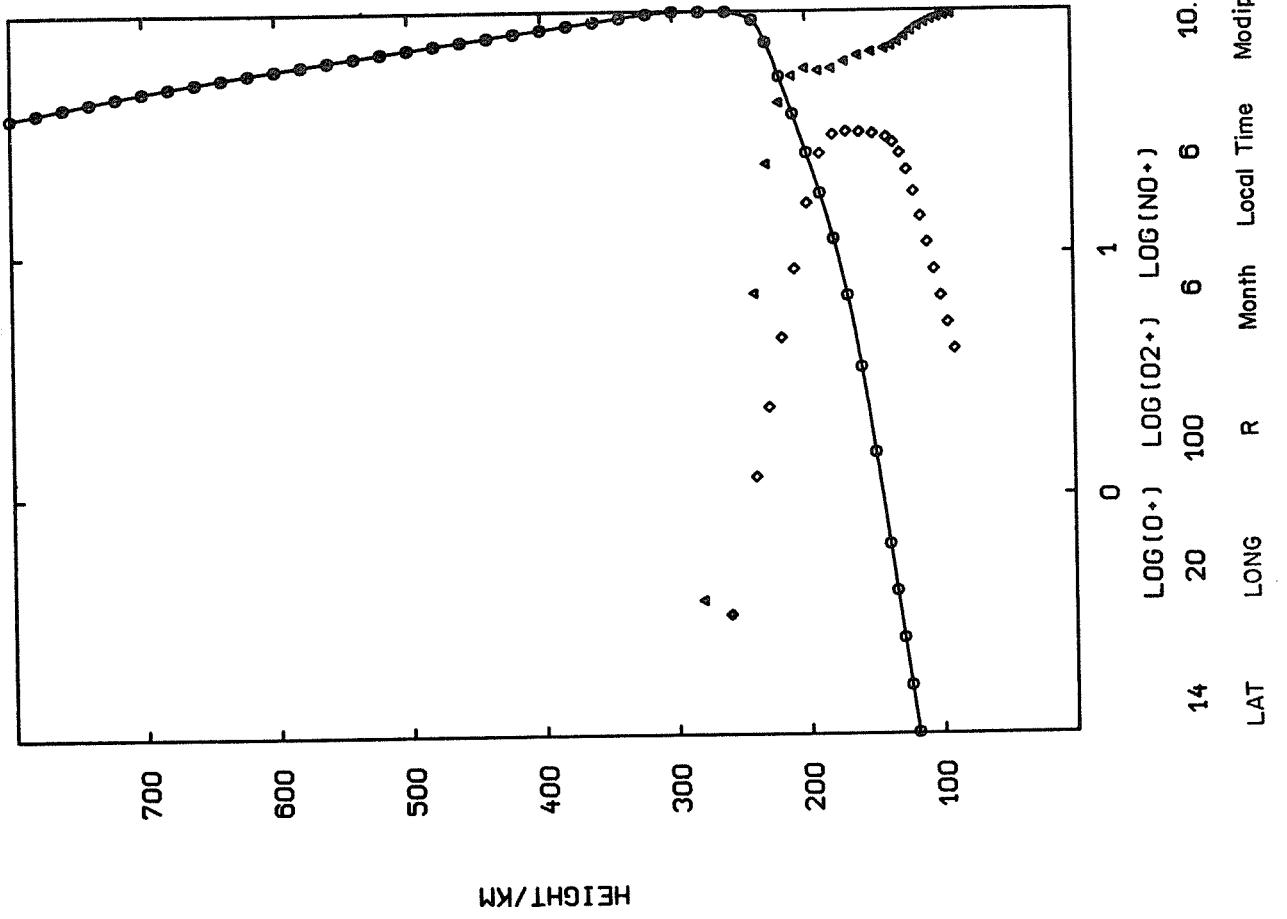


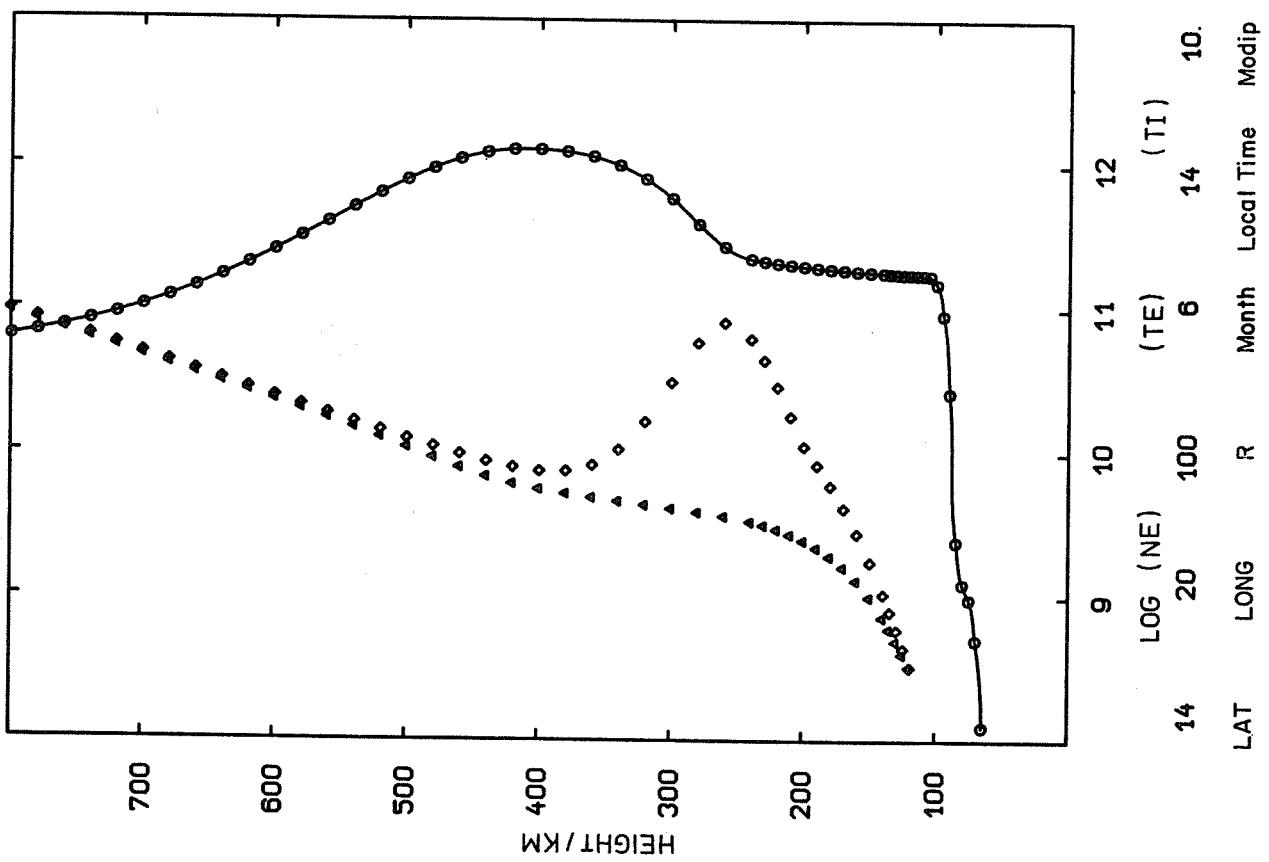
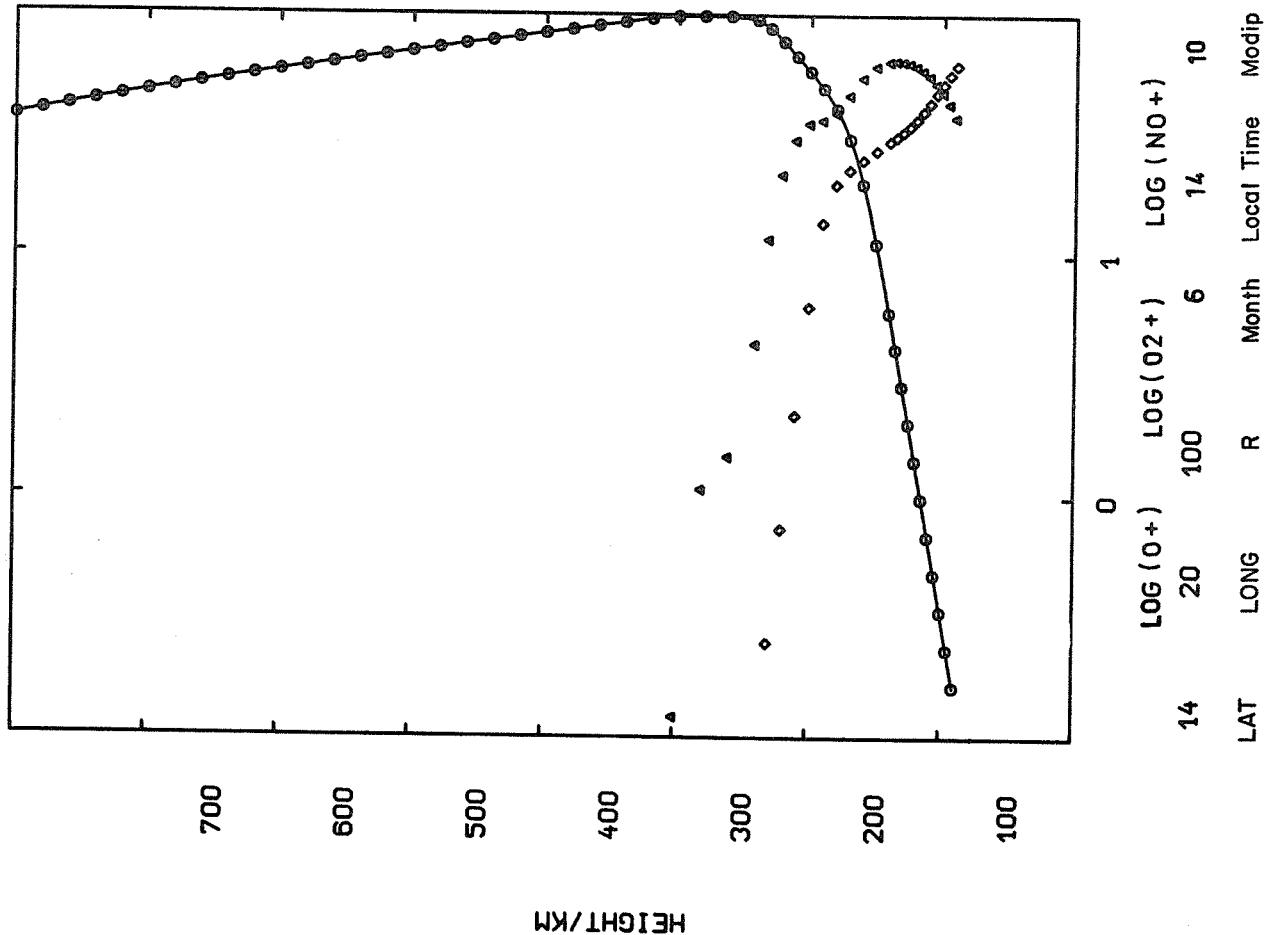


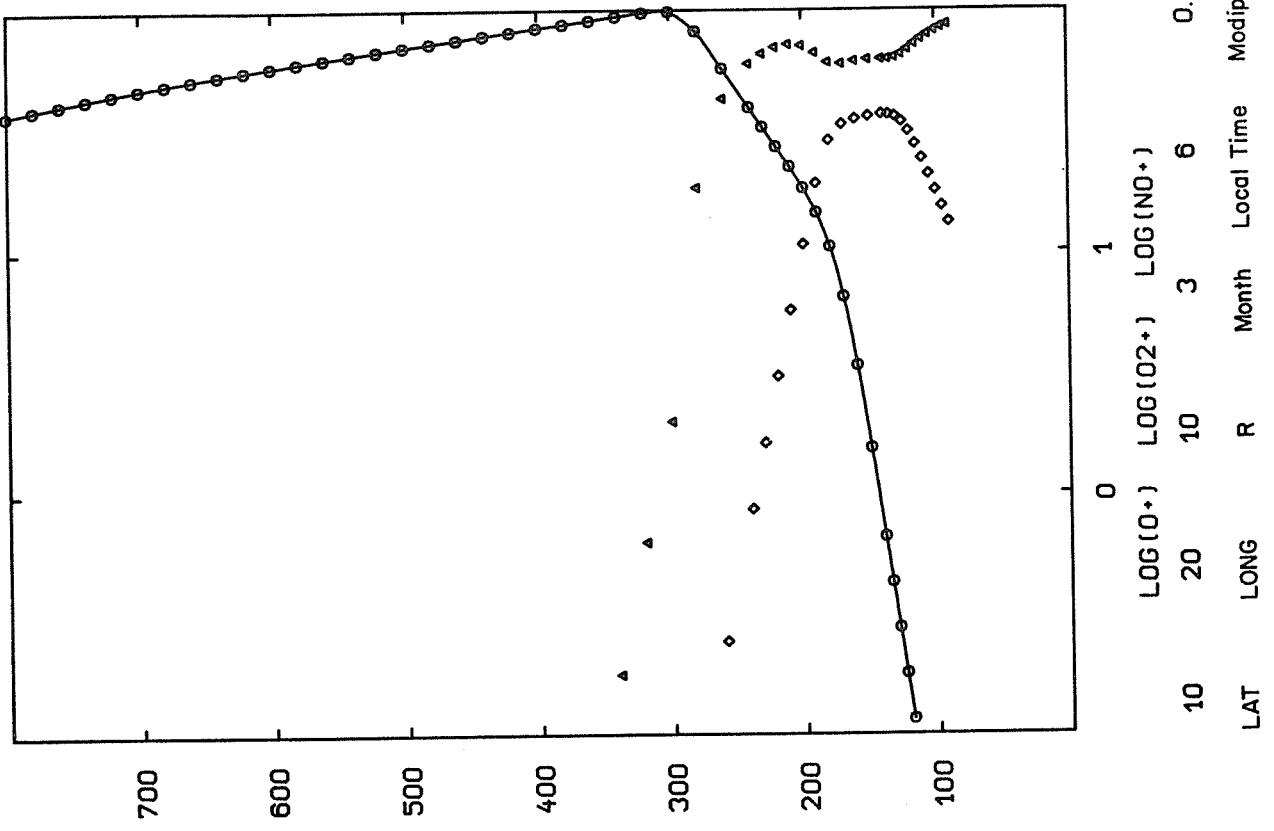




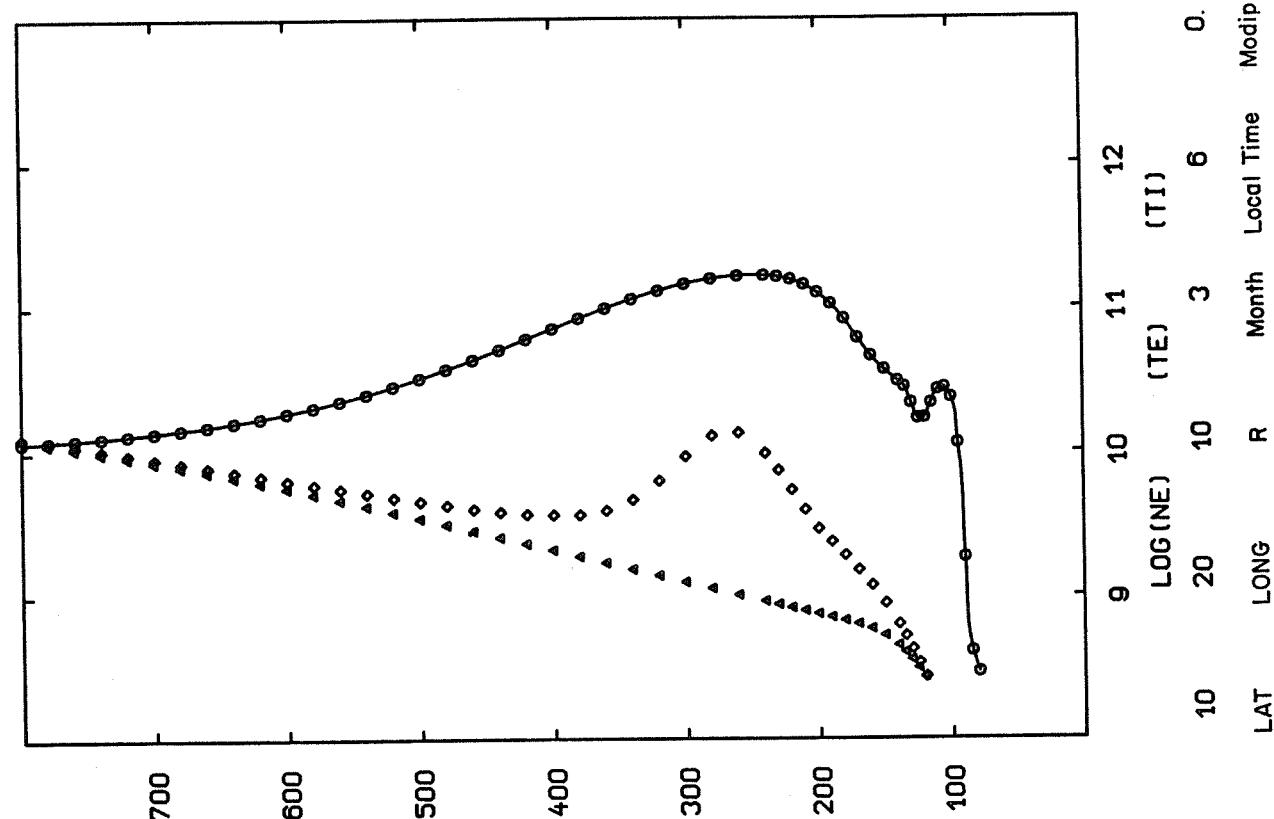




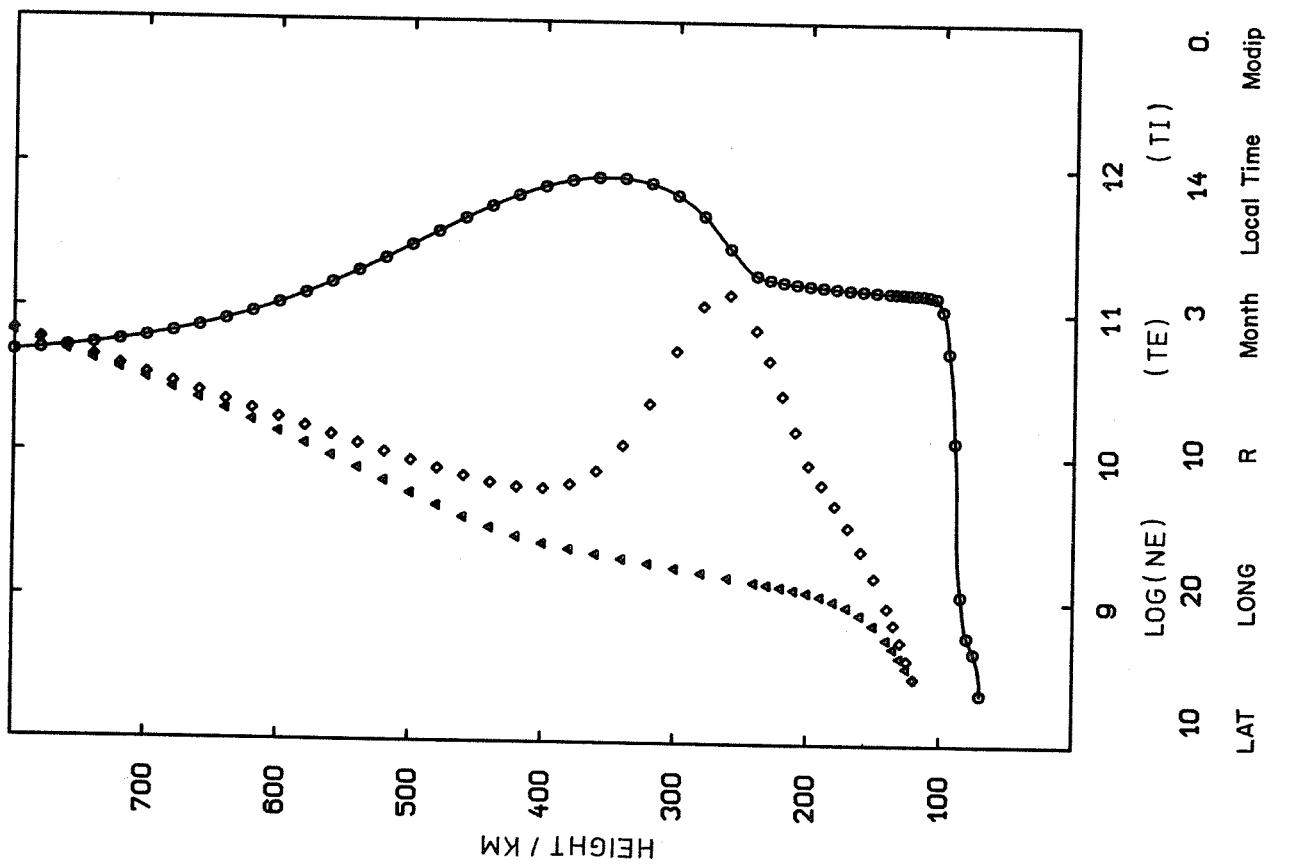
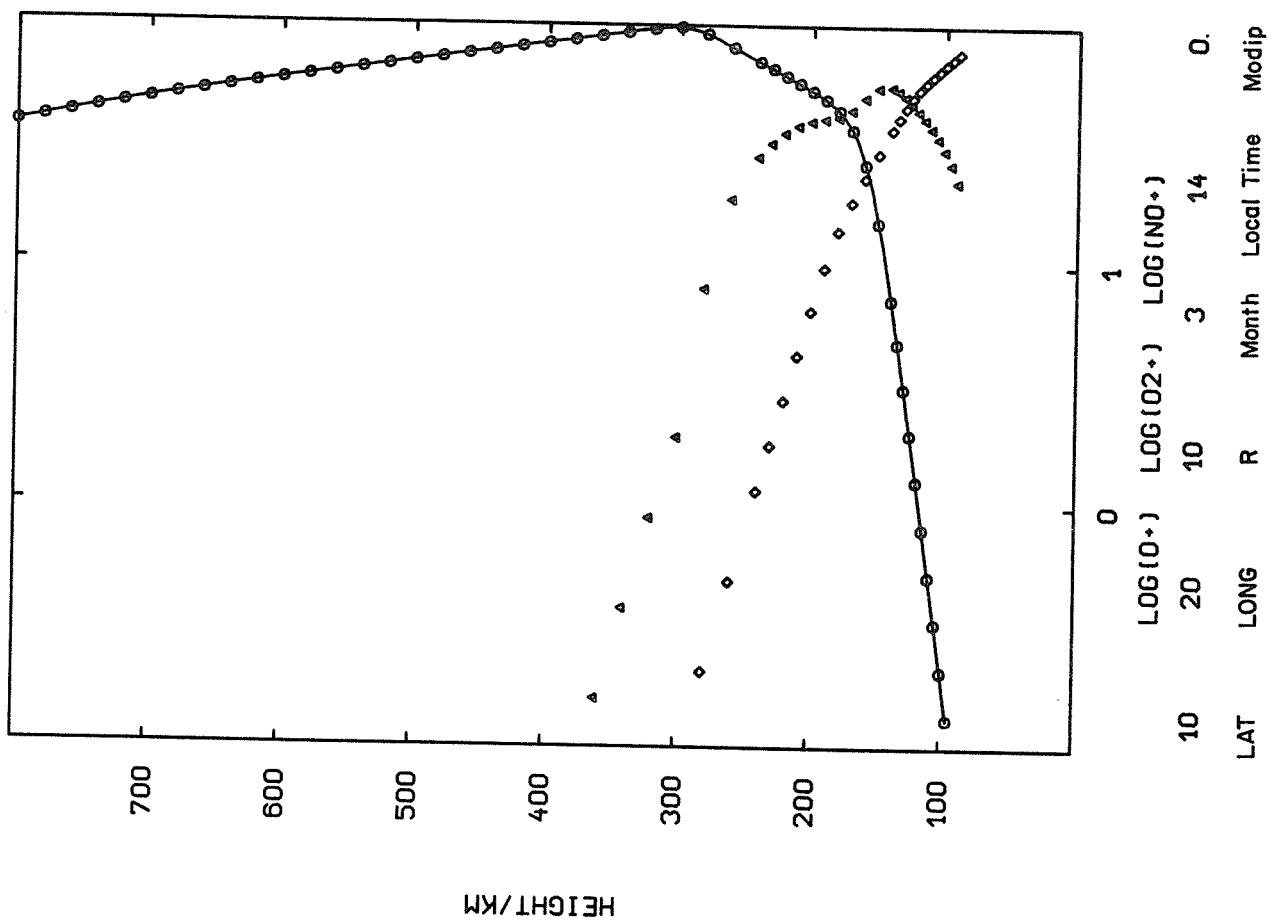


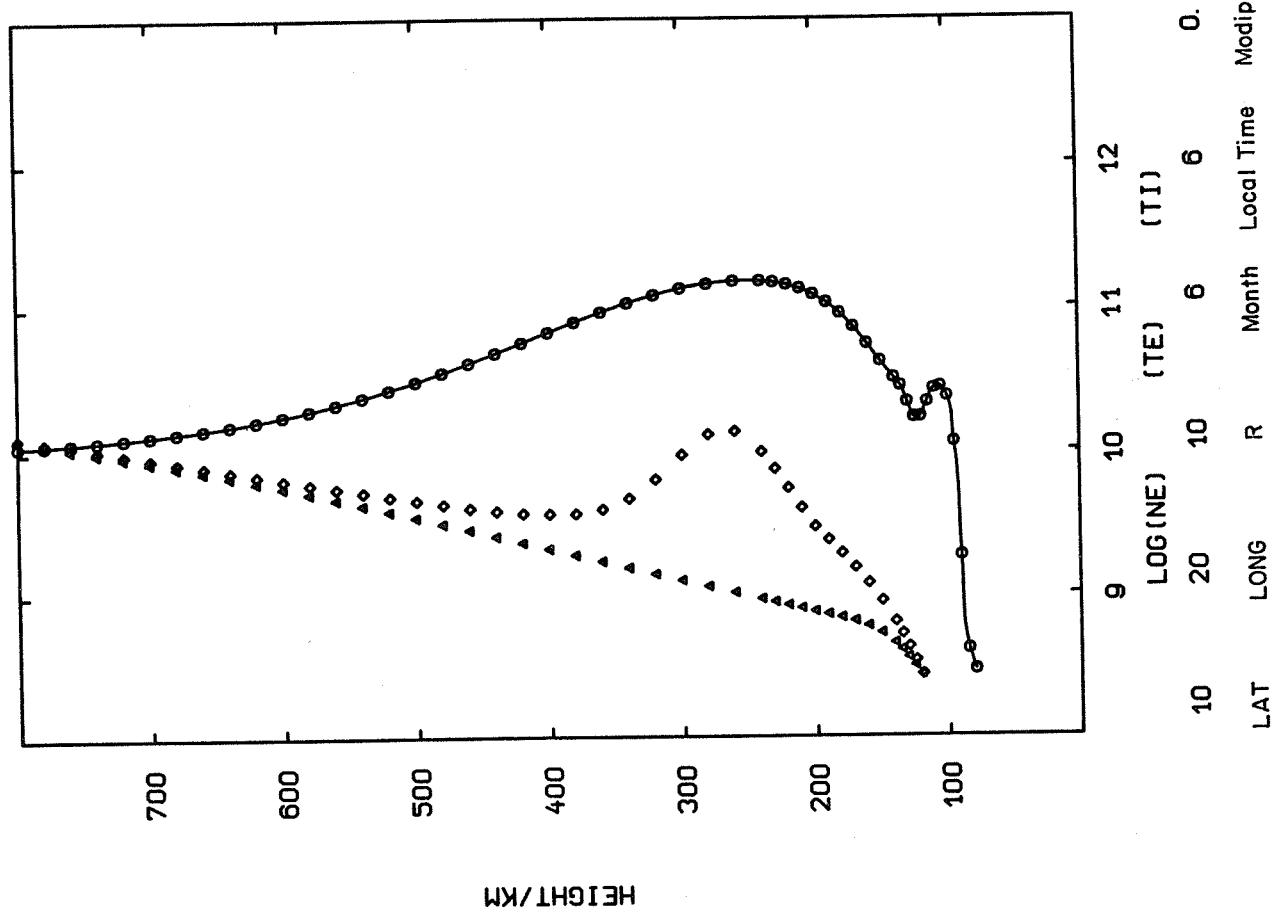
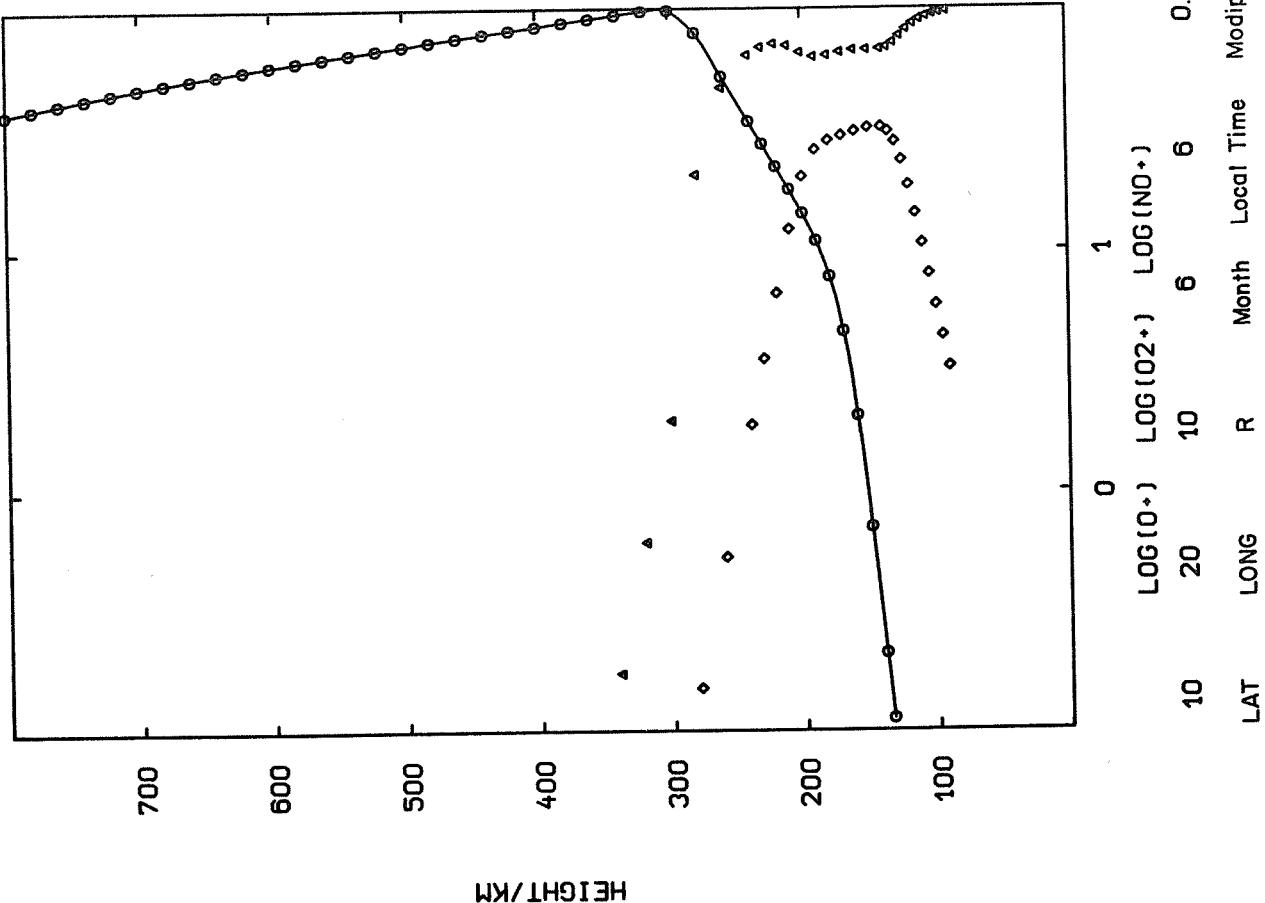


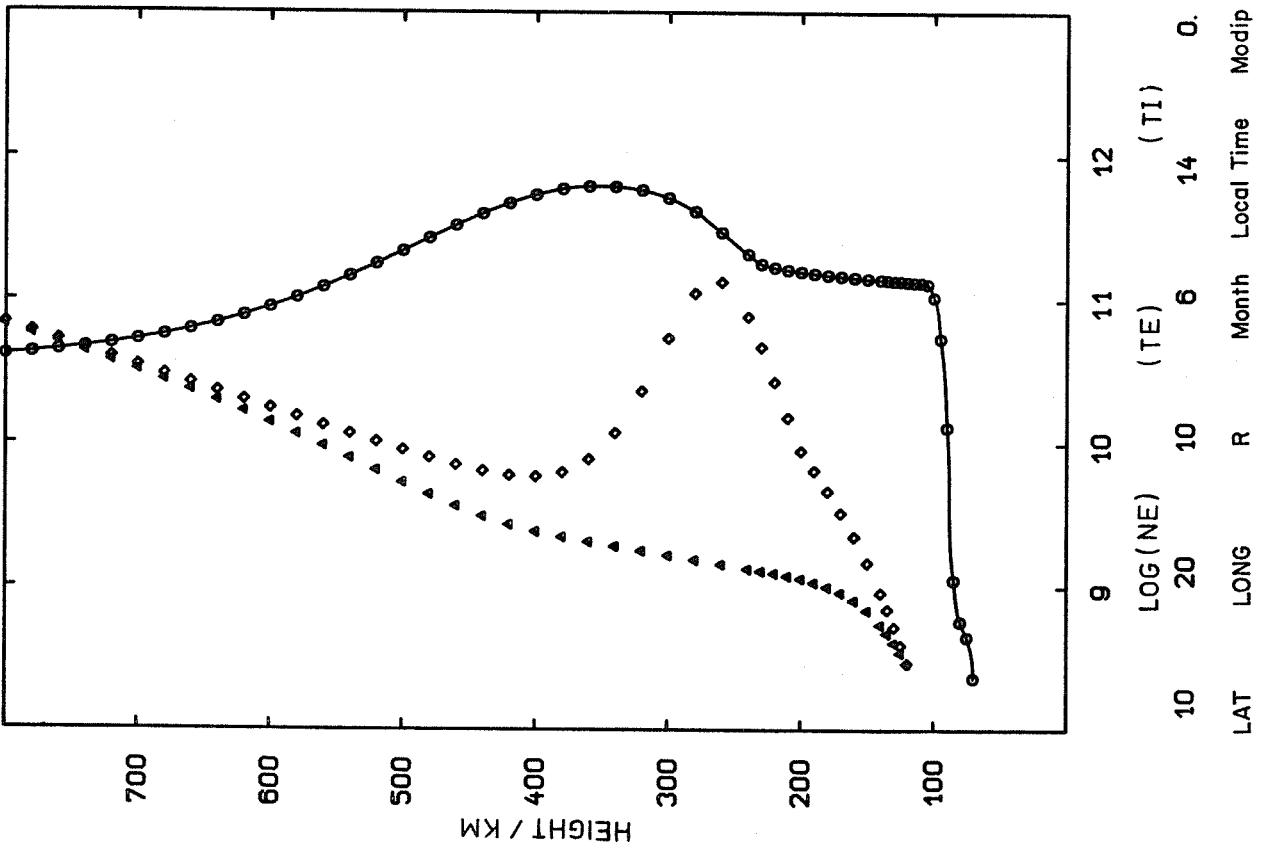
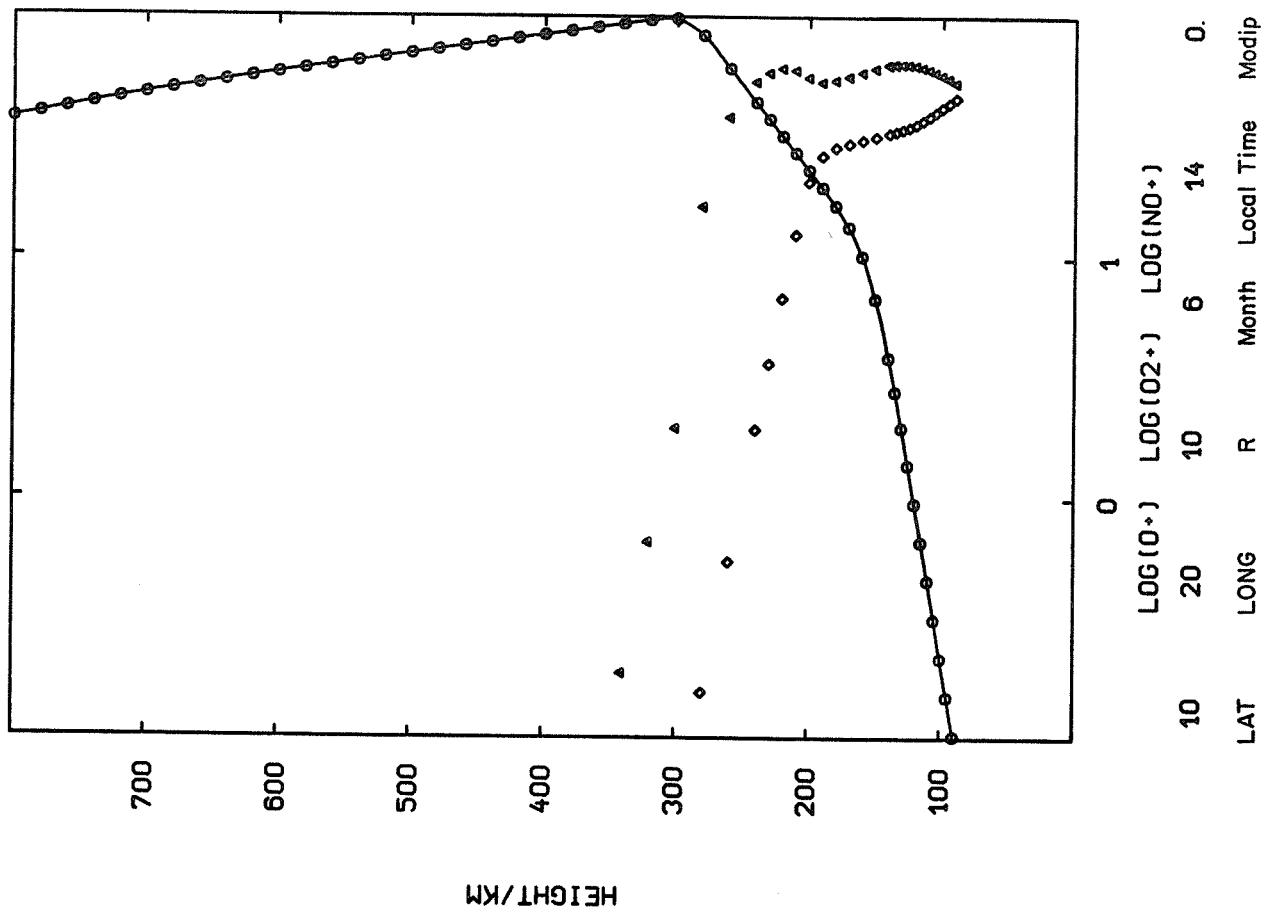
HEIGHT / KM

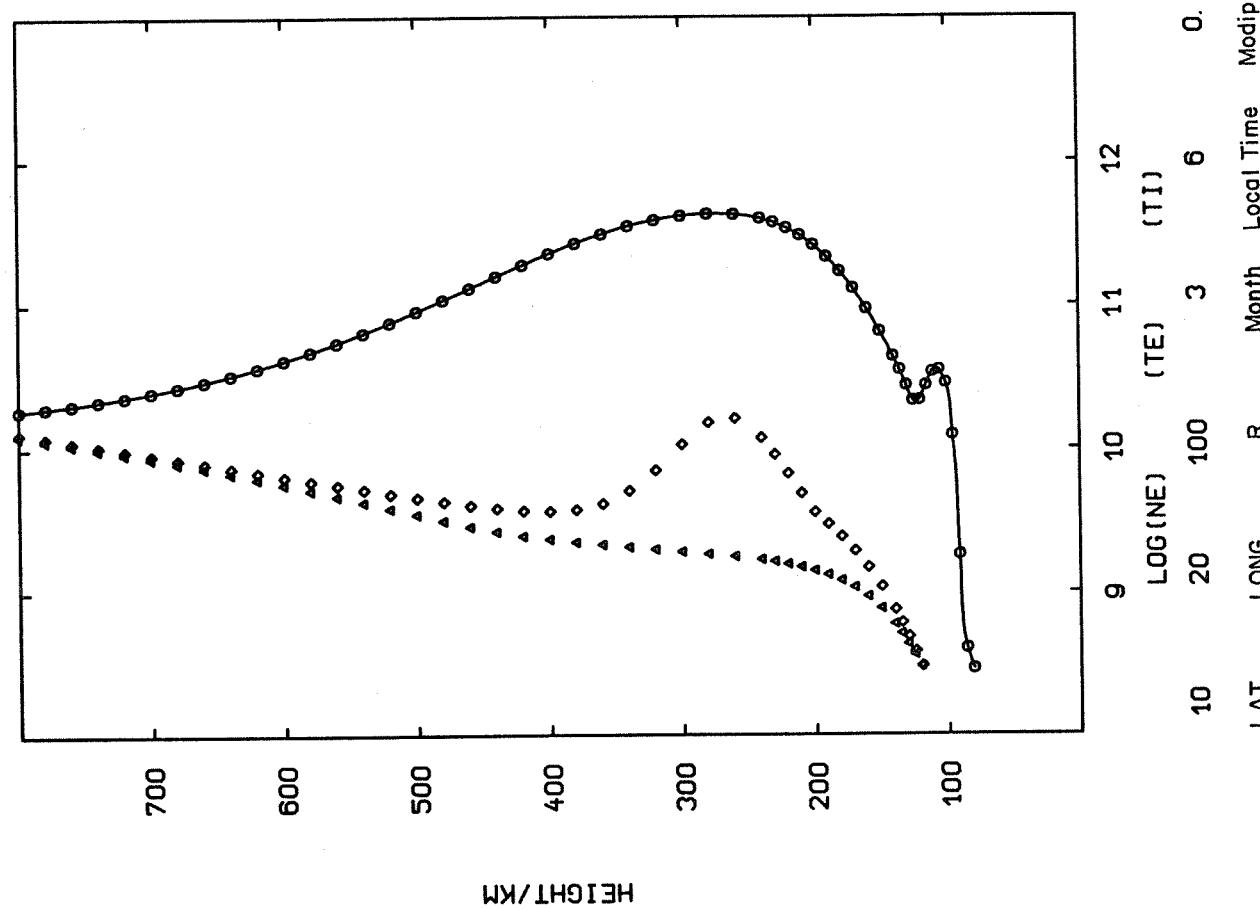
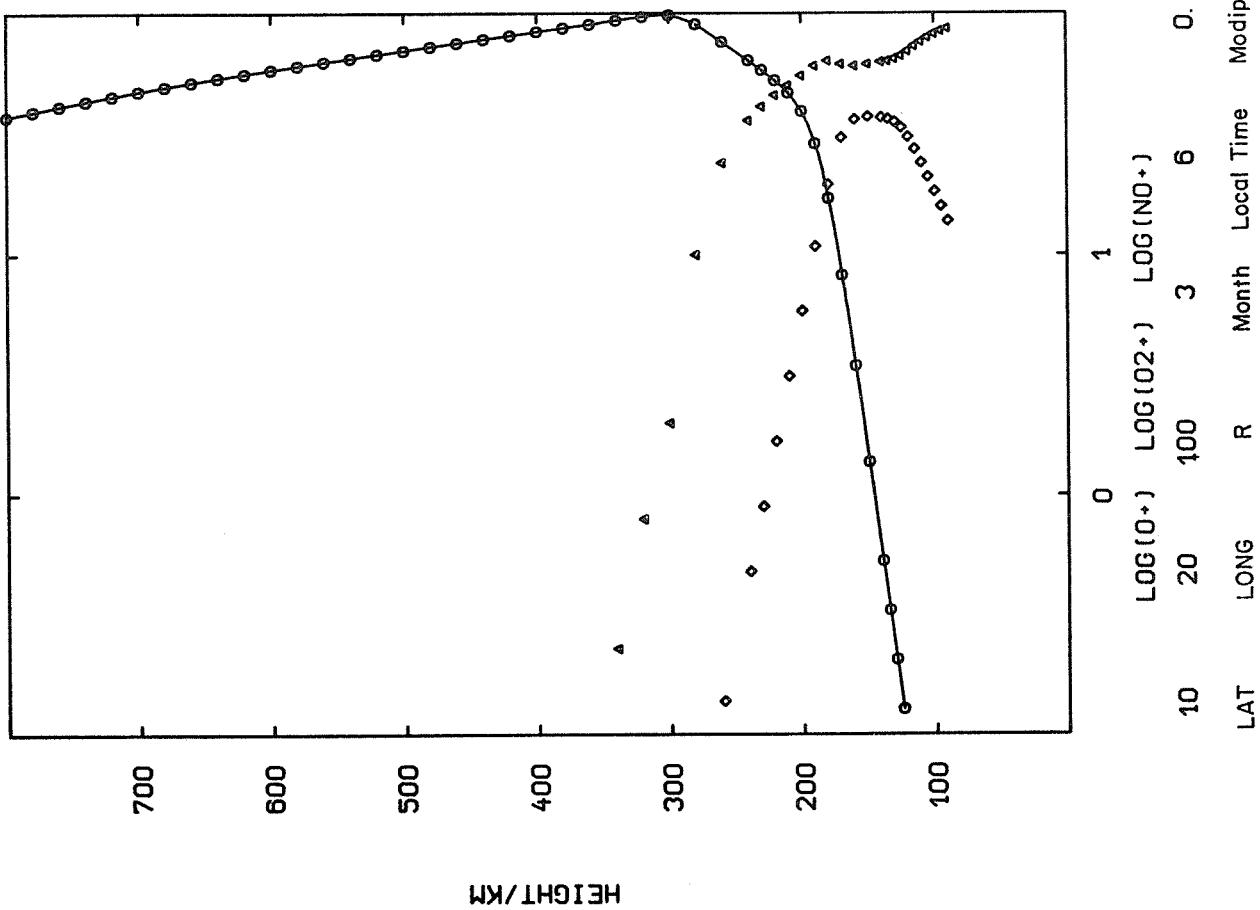


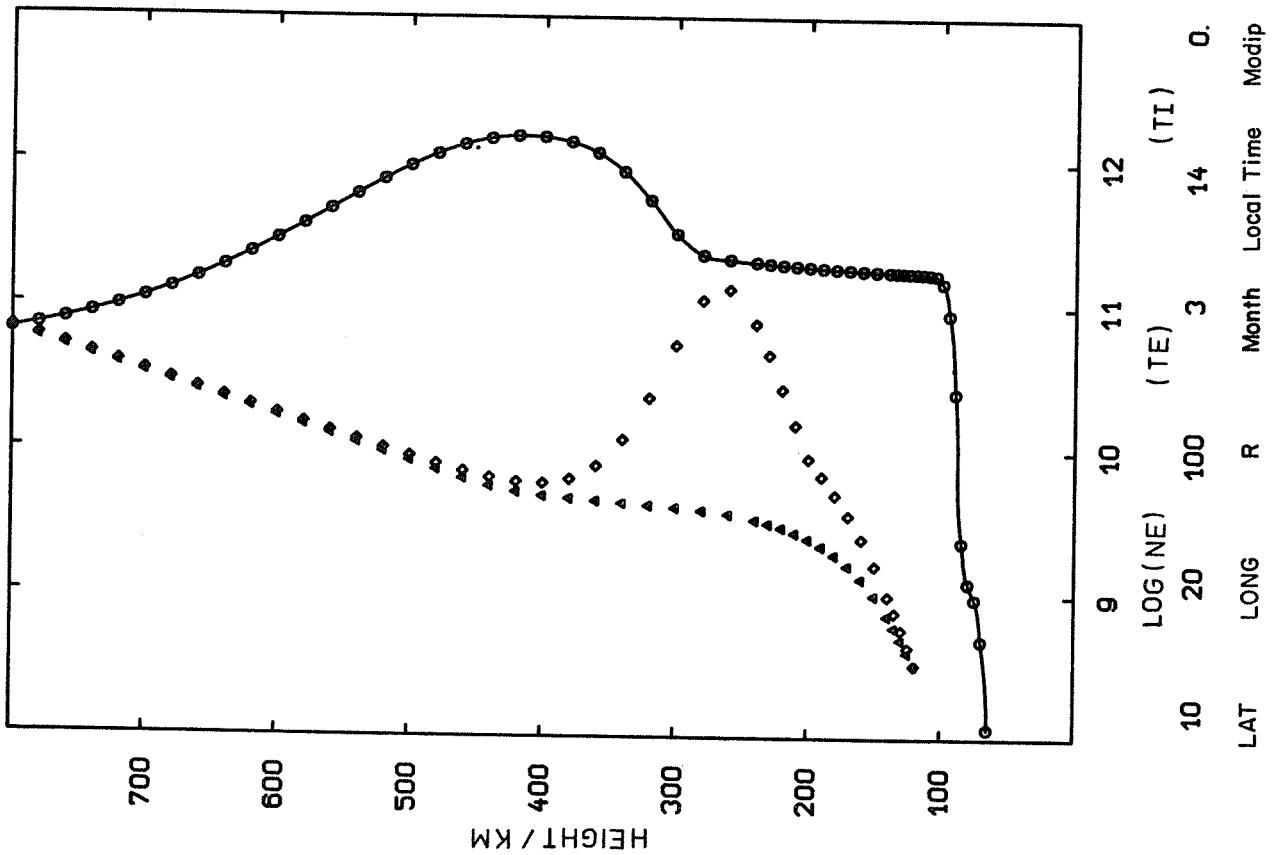
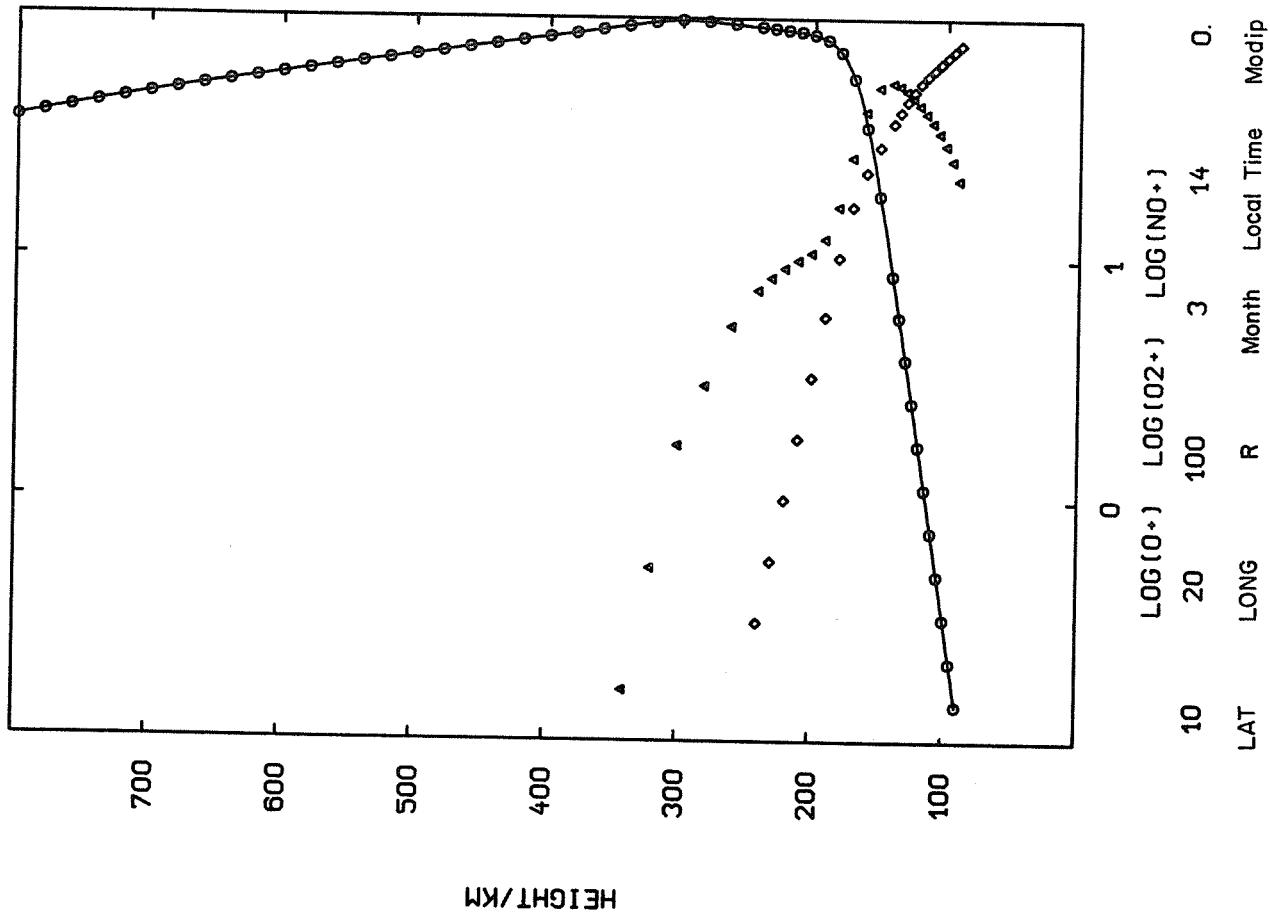
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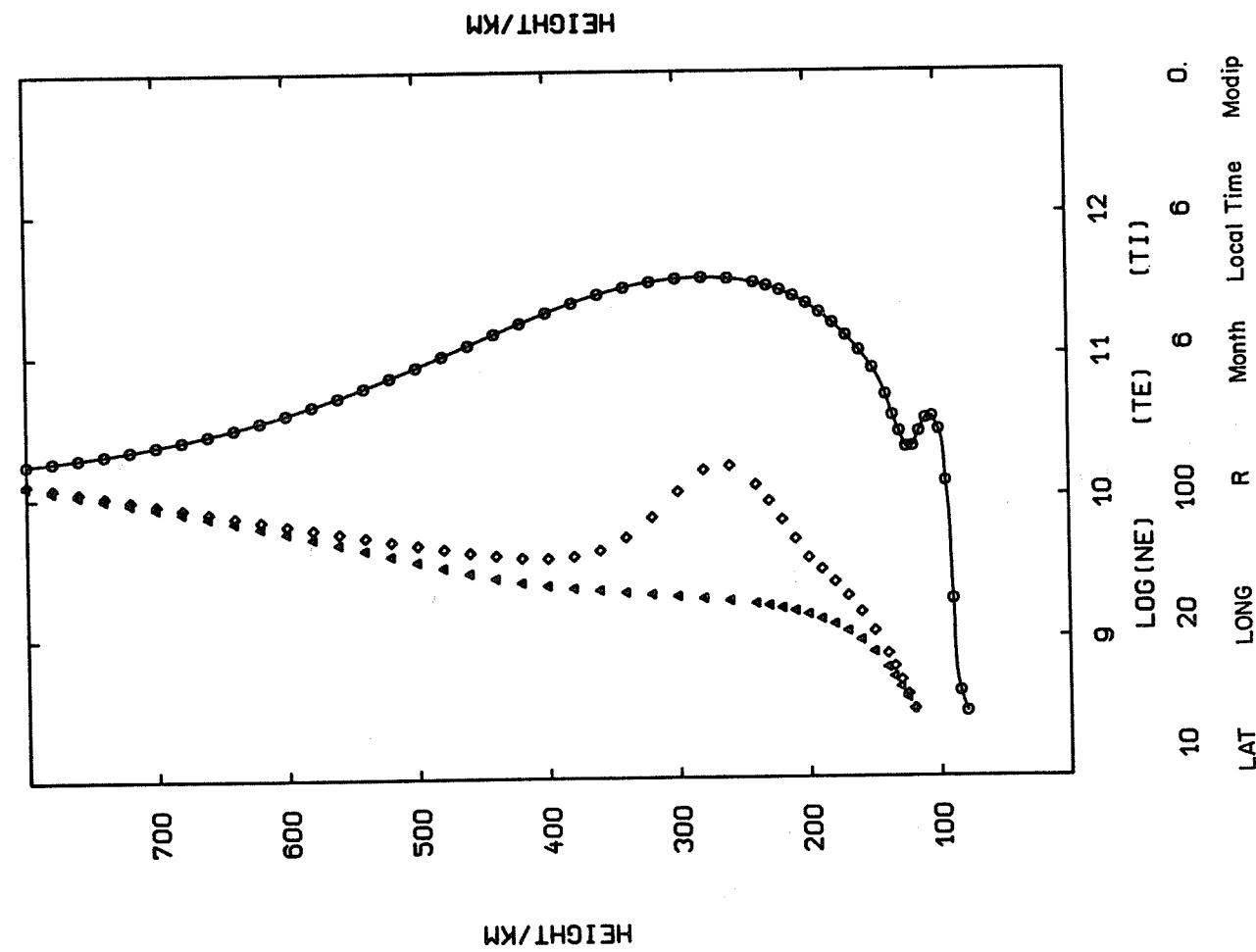
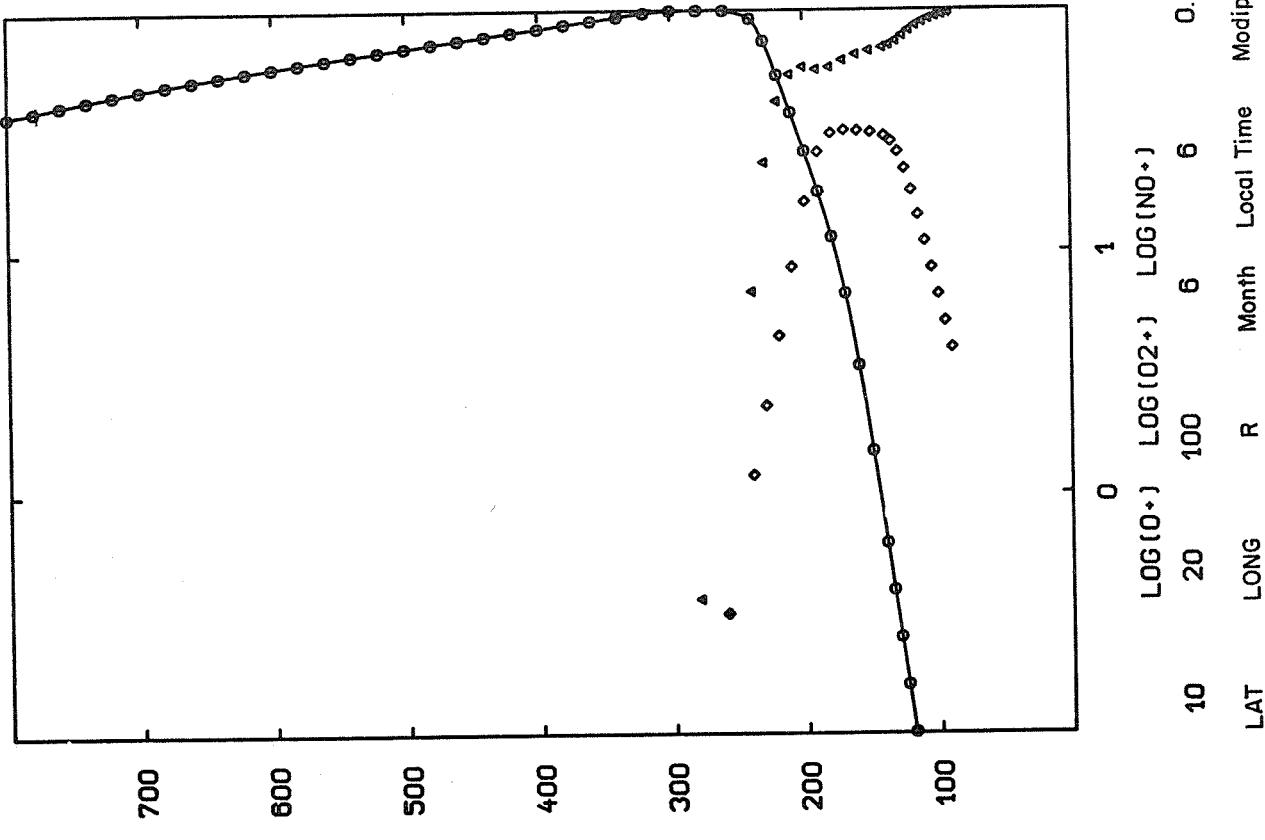


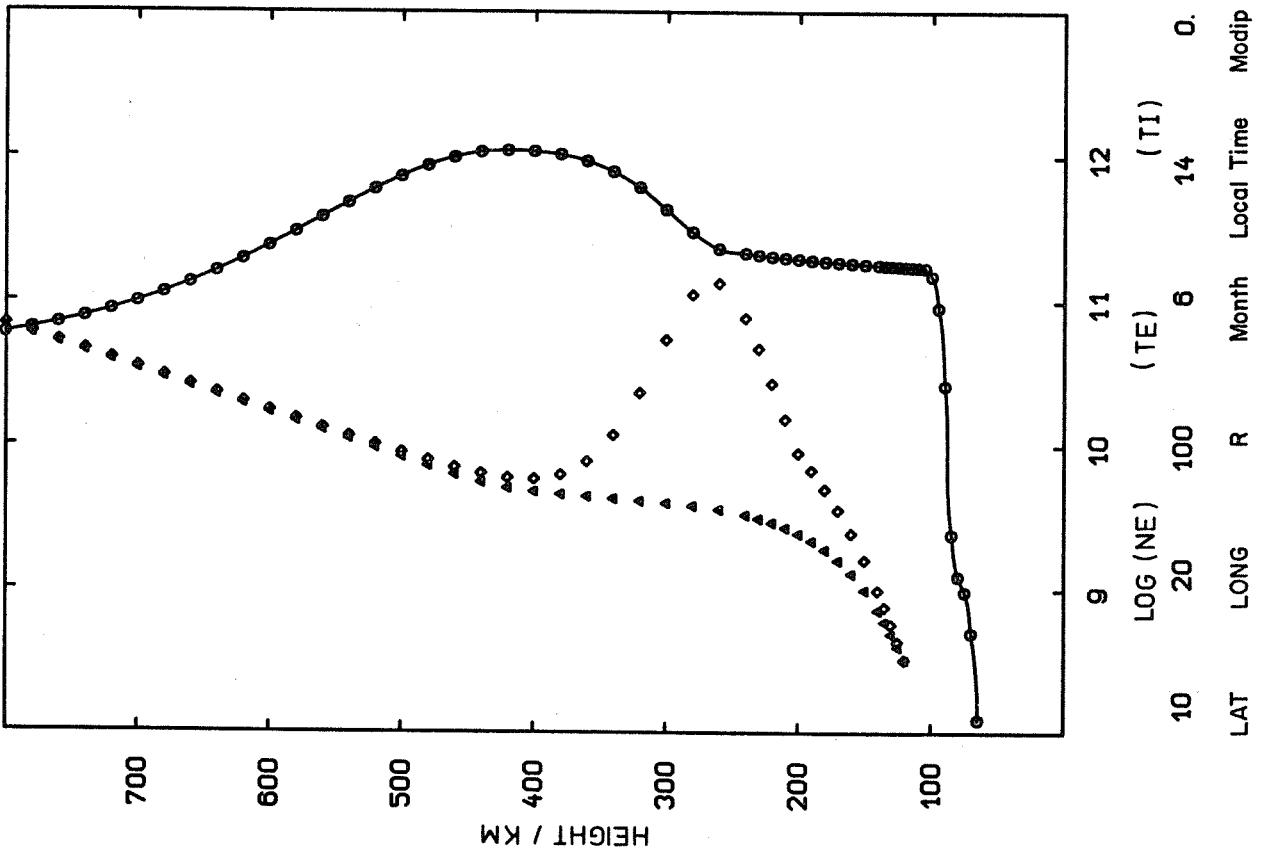
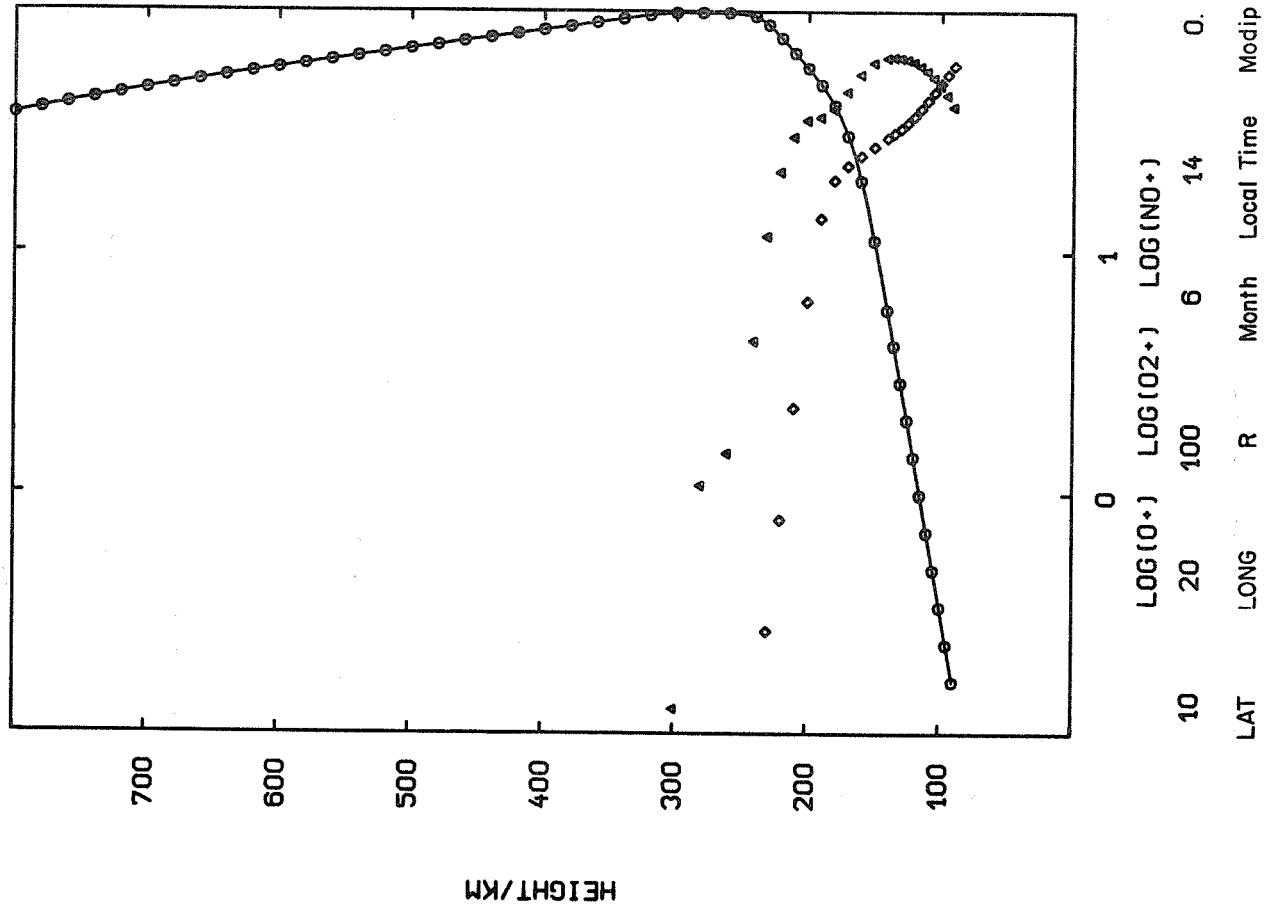


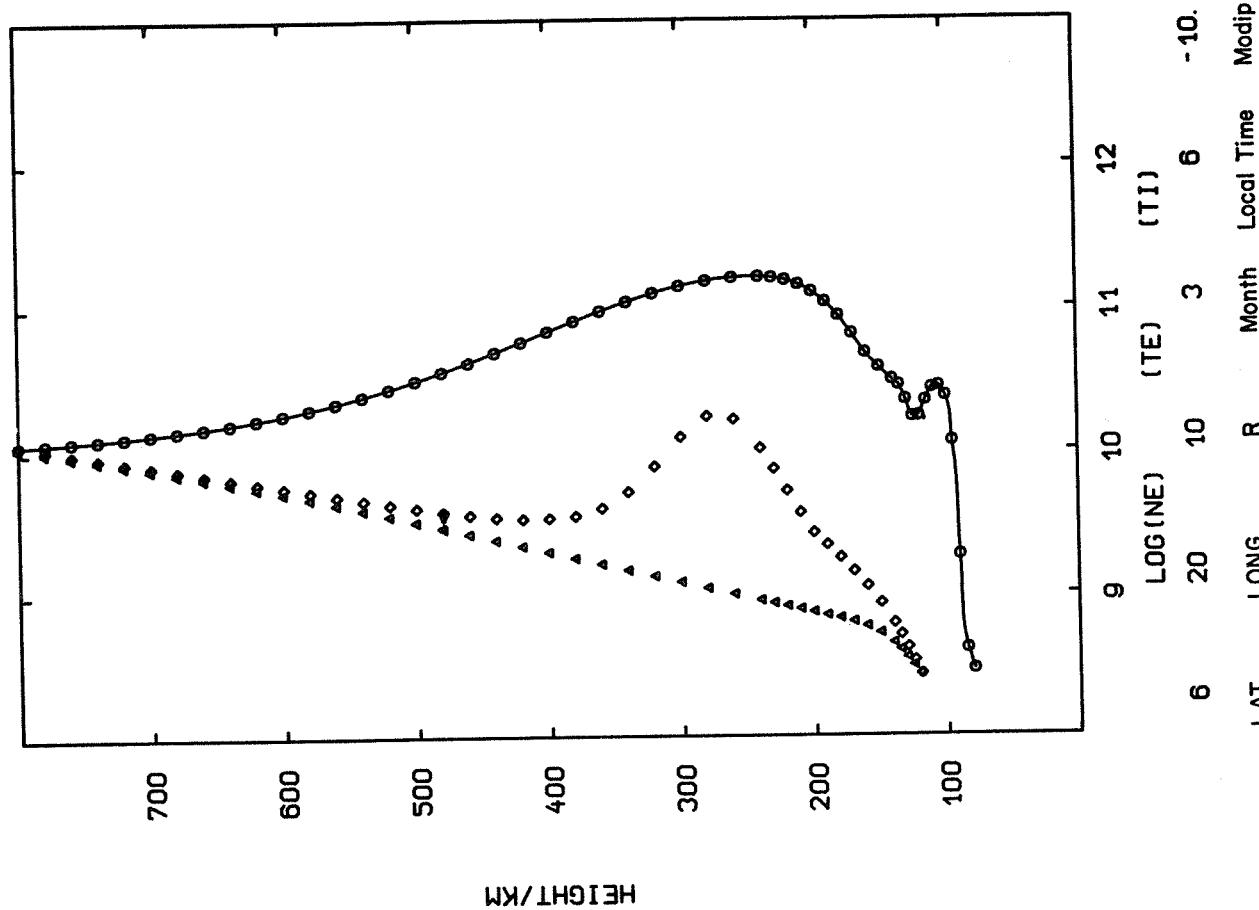
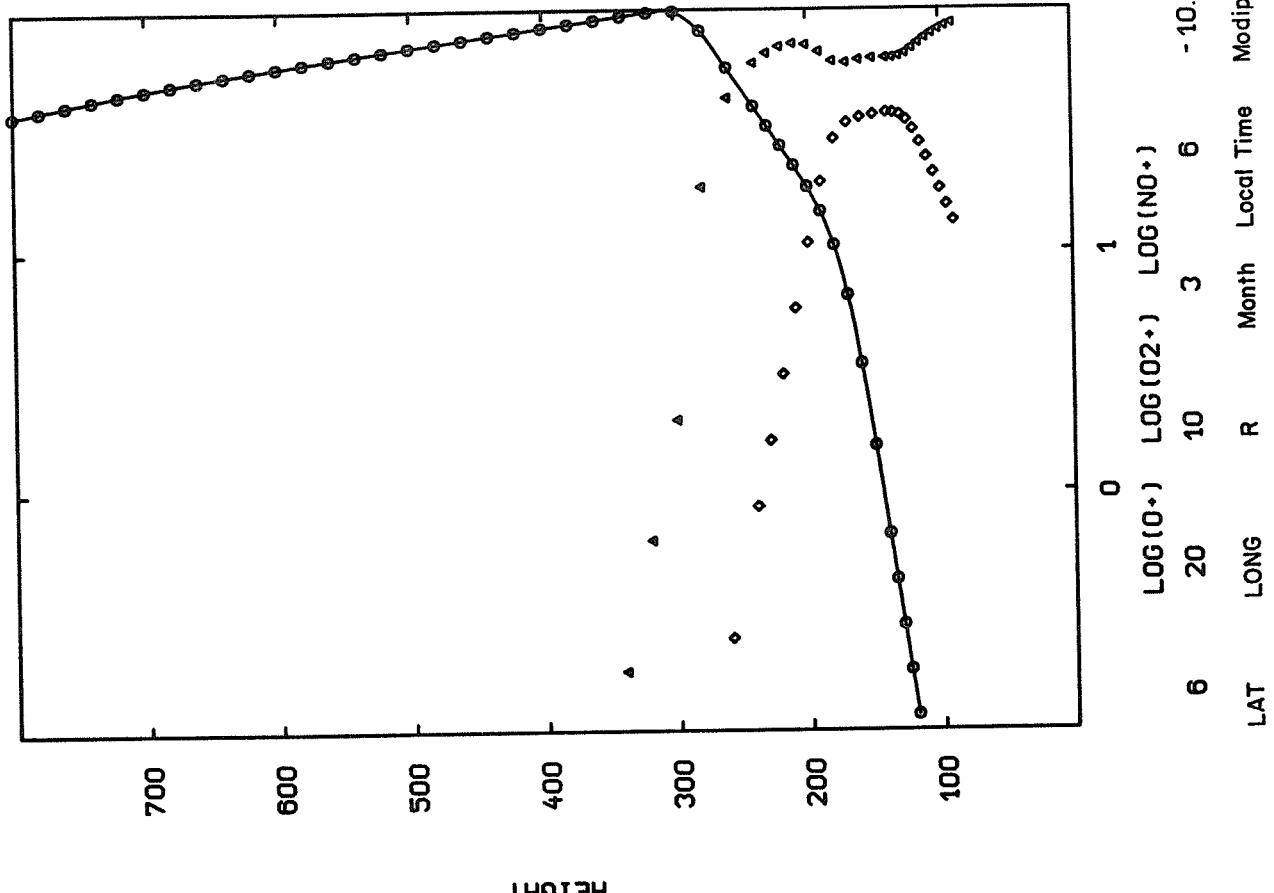


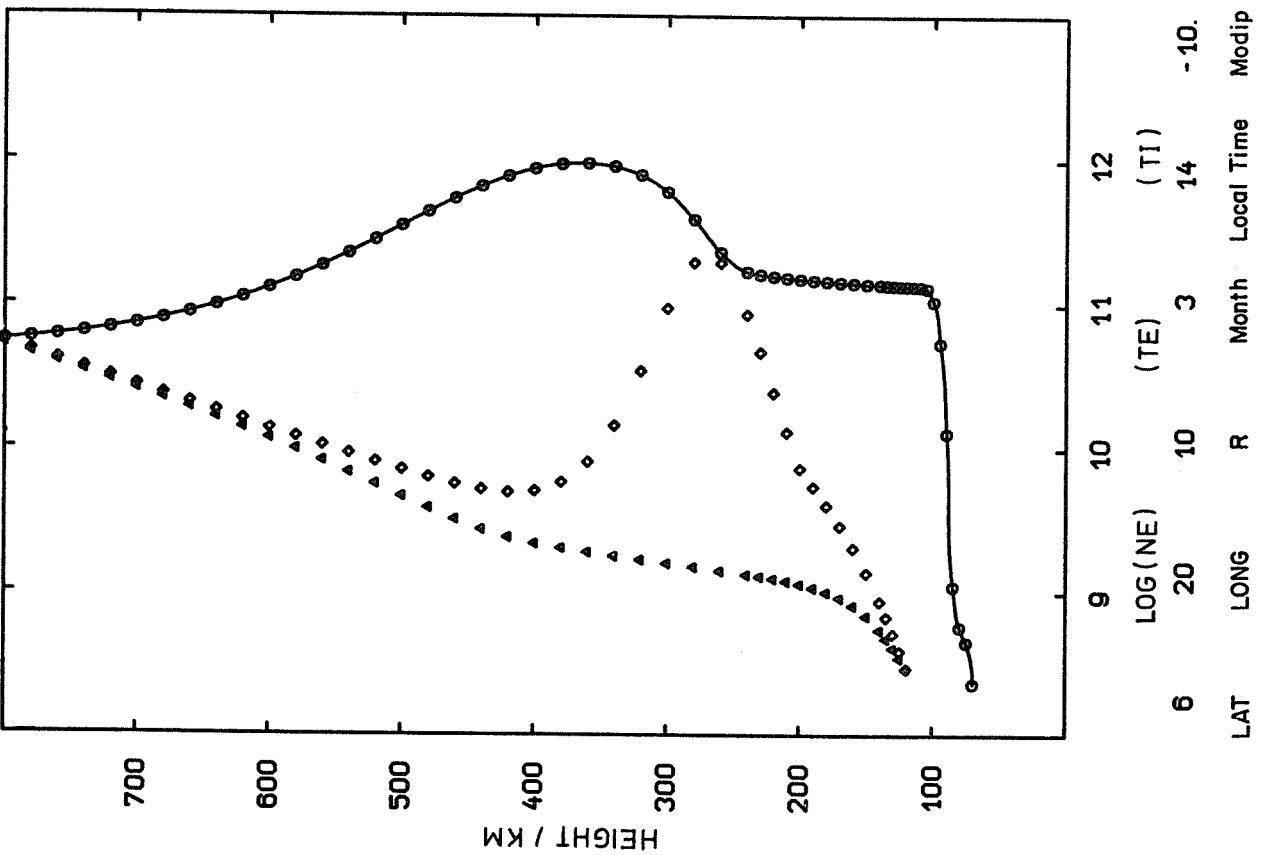
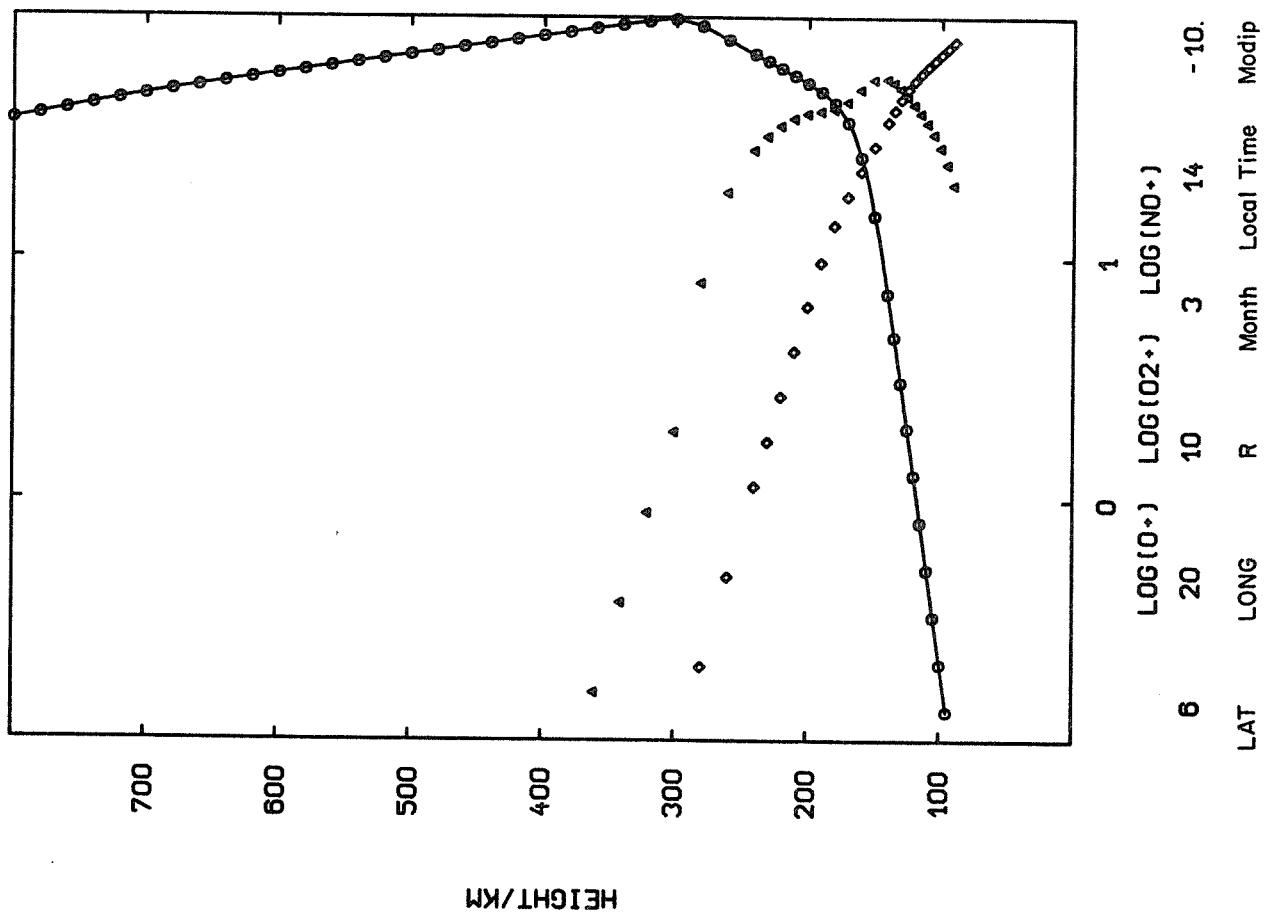


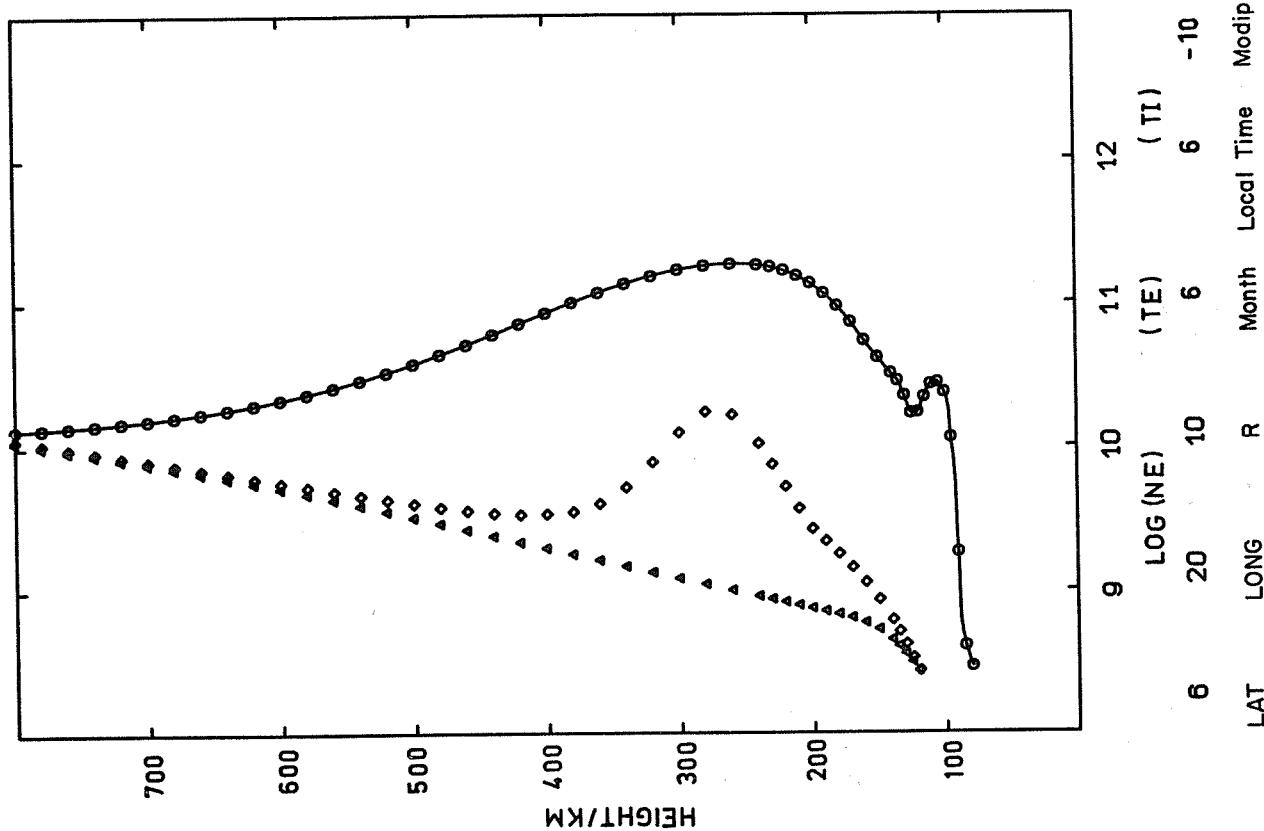
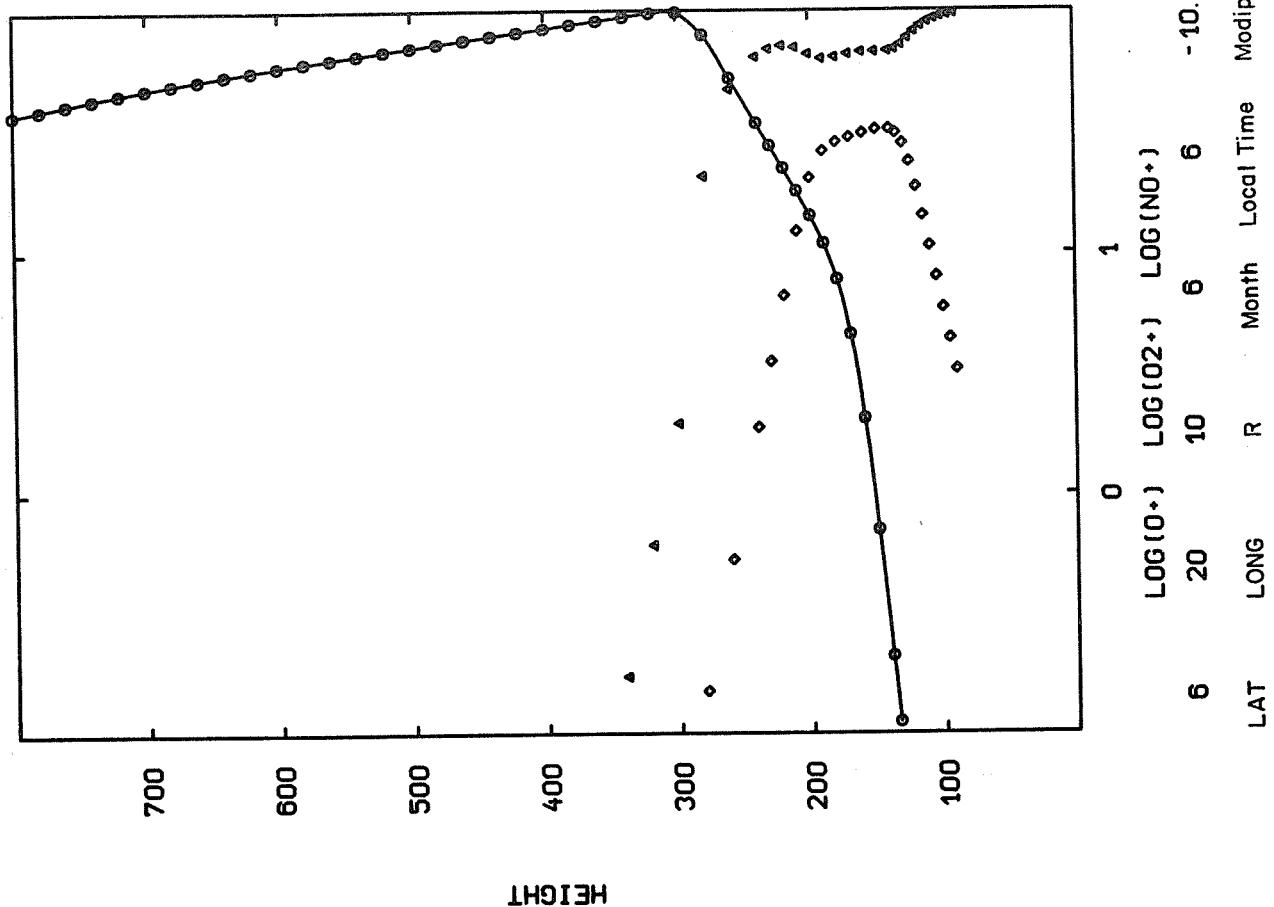


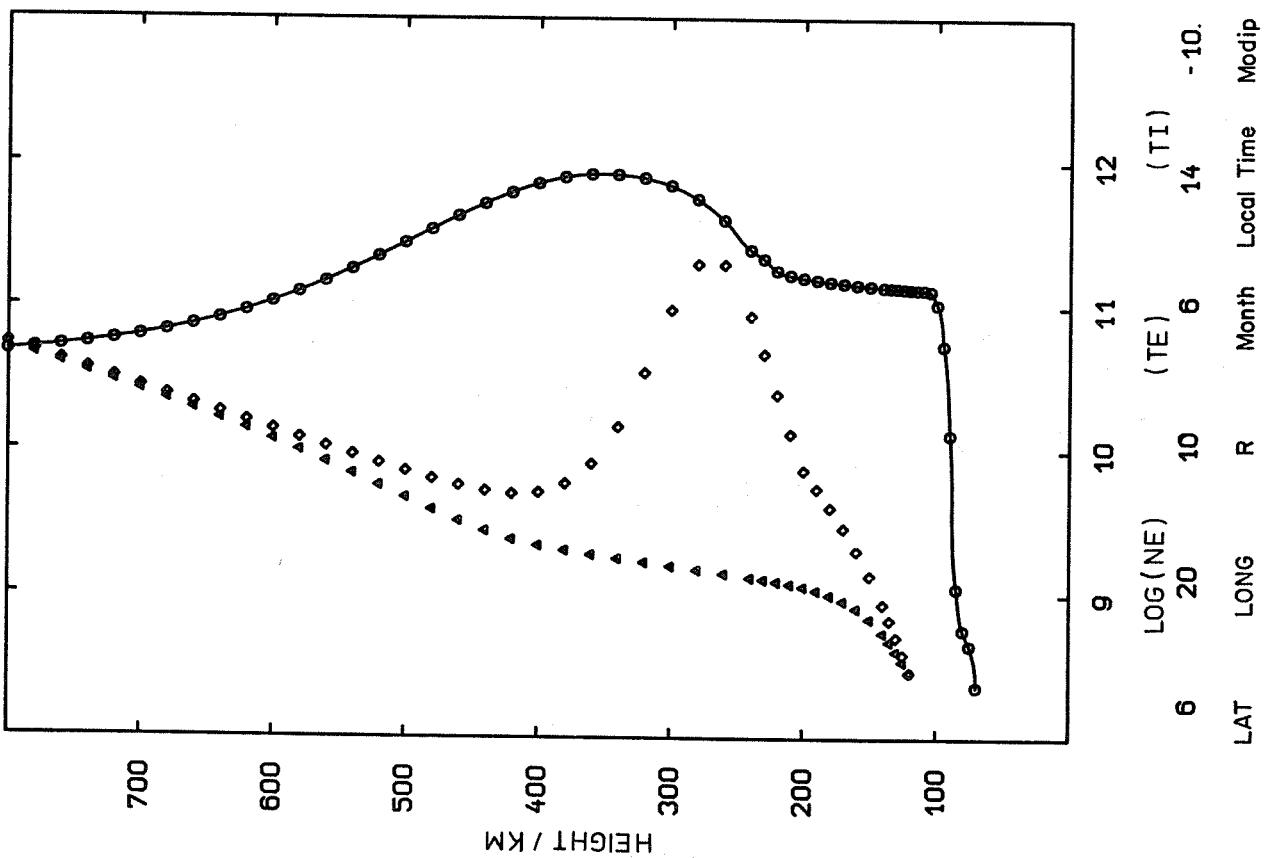
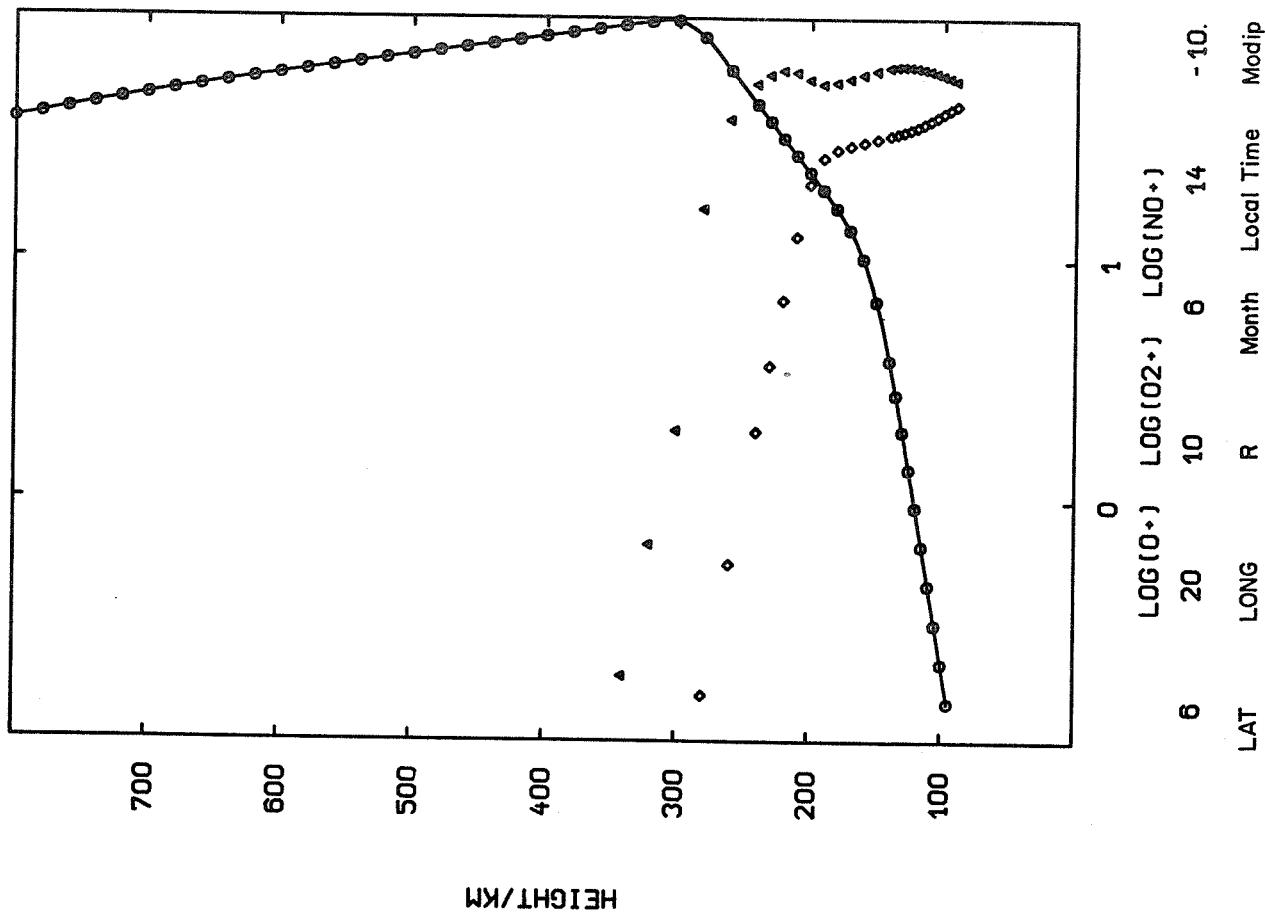


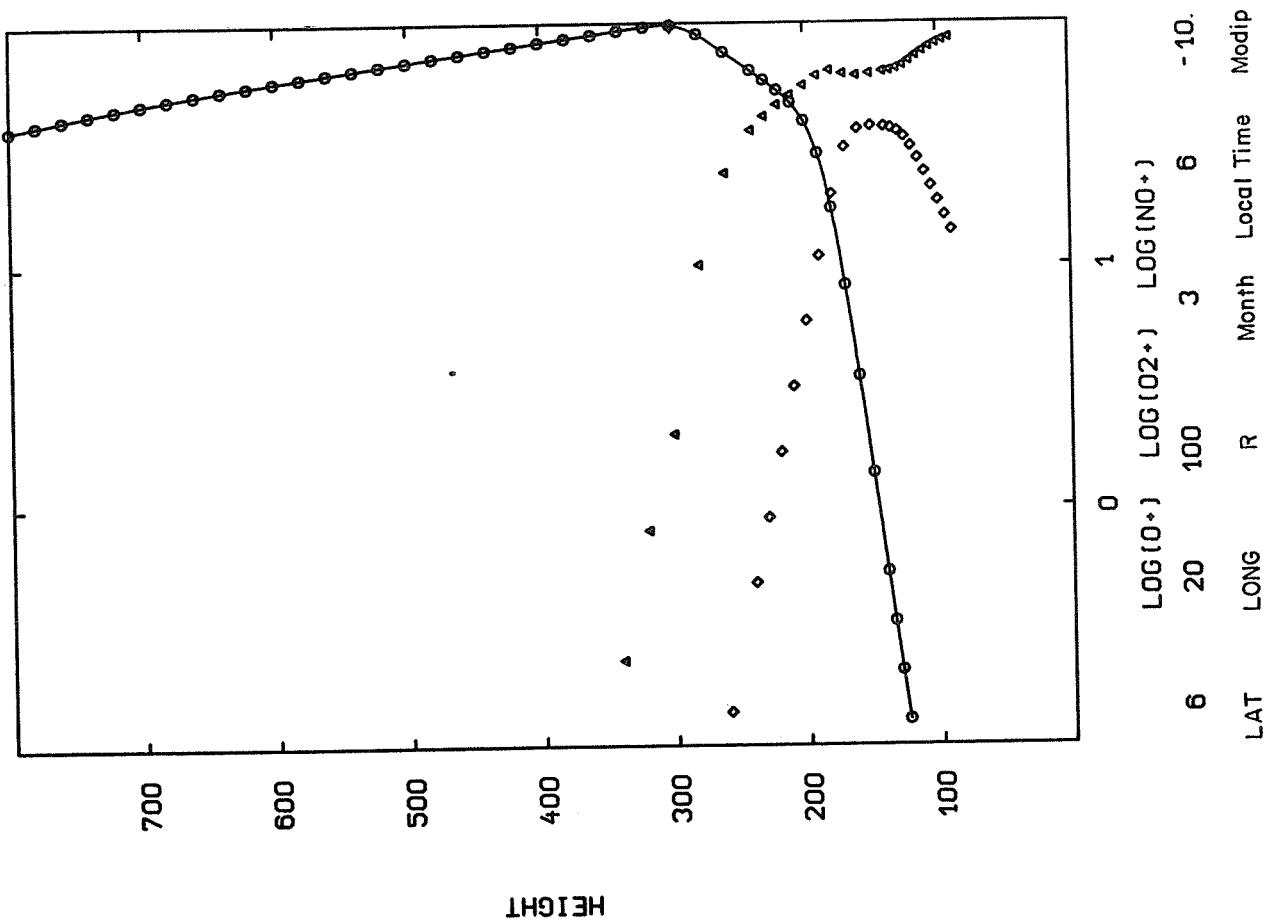




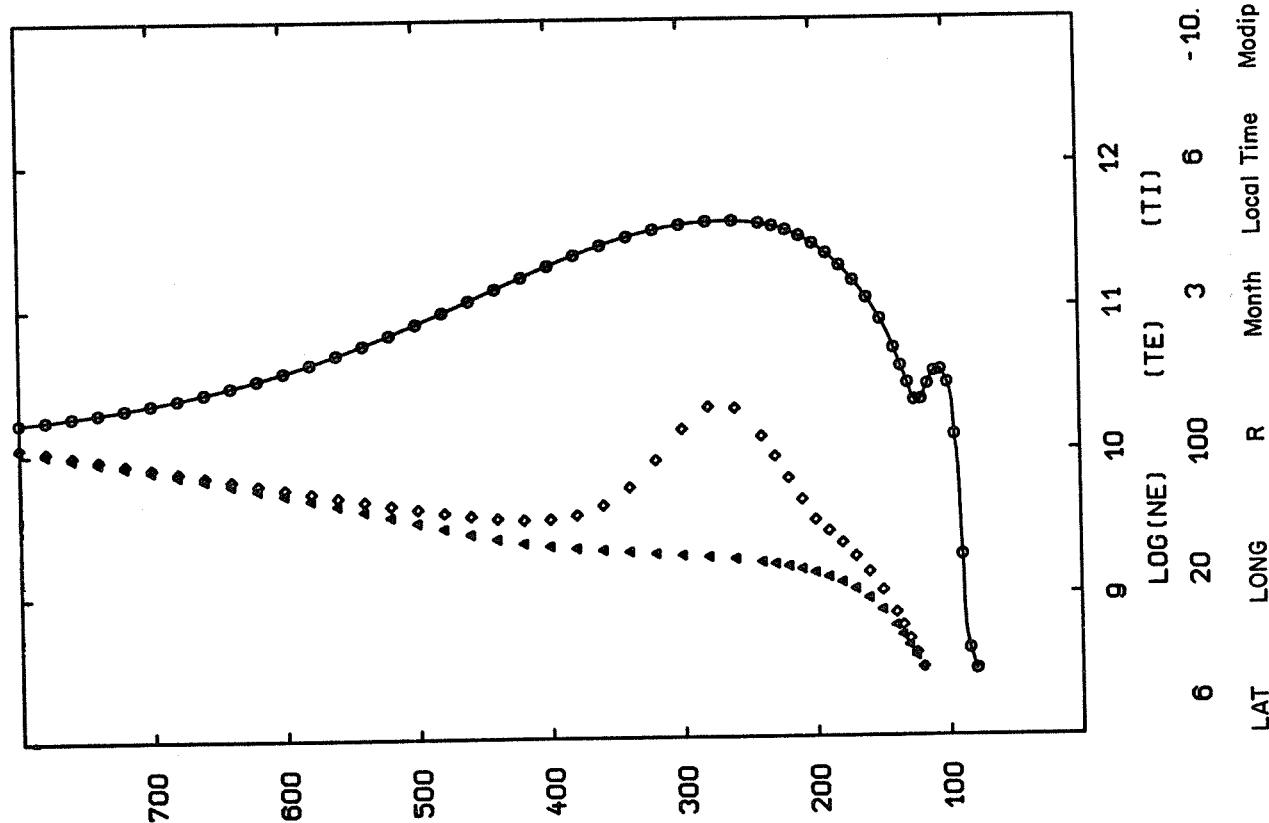




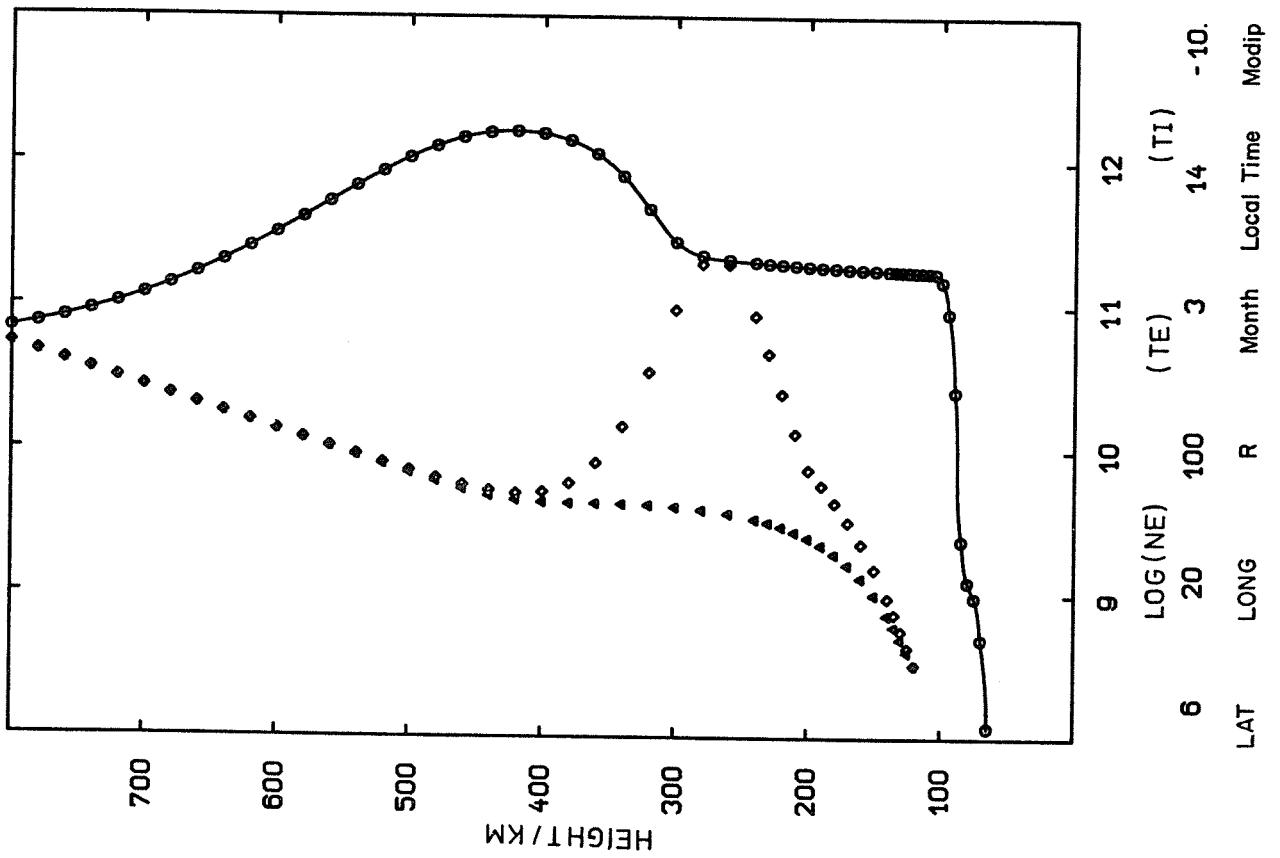
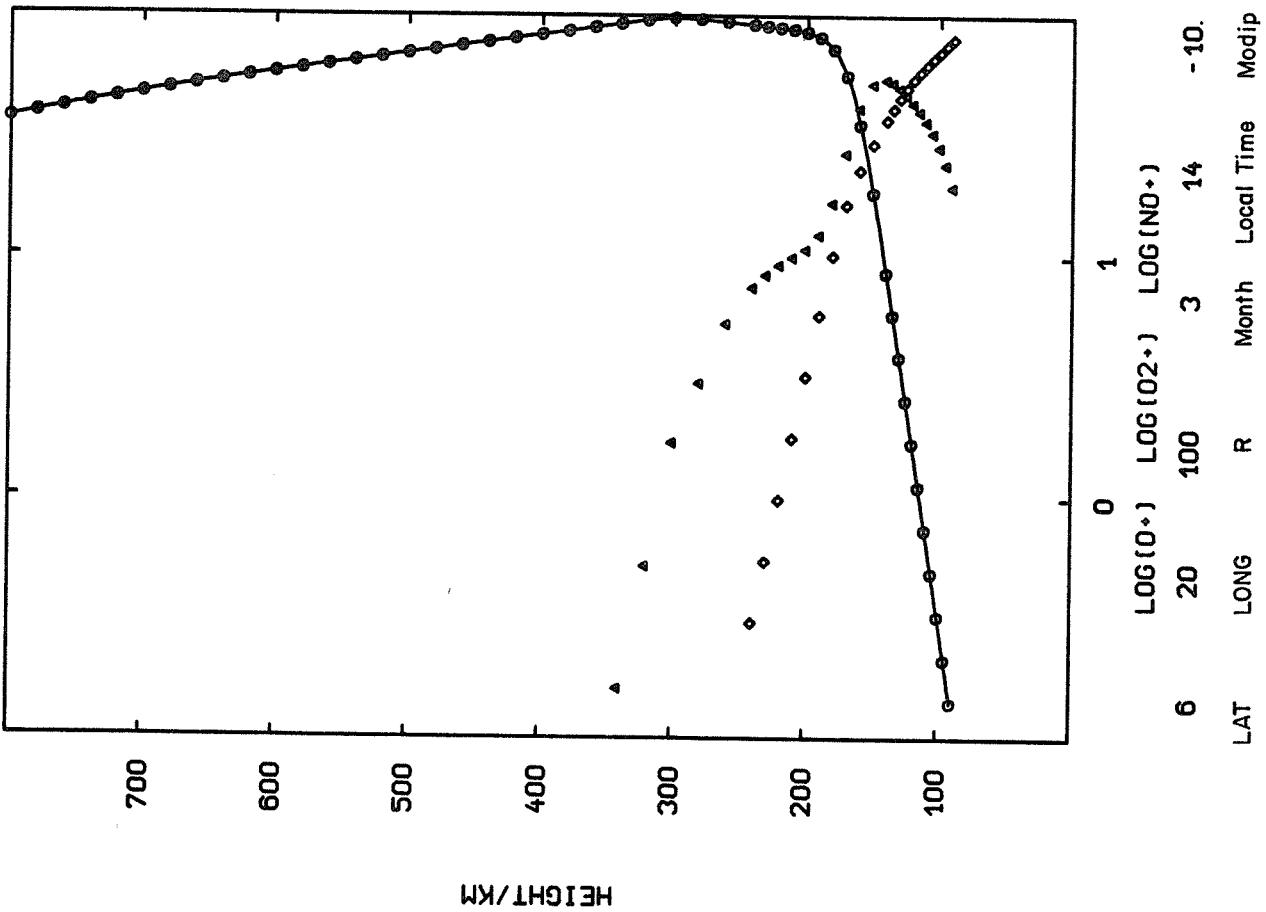


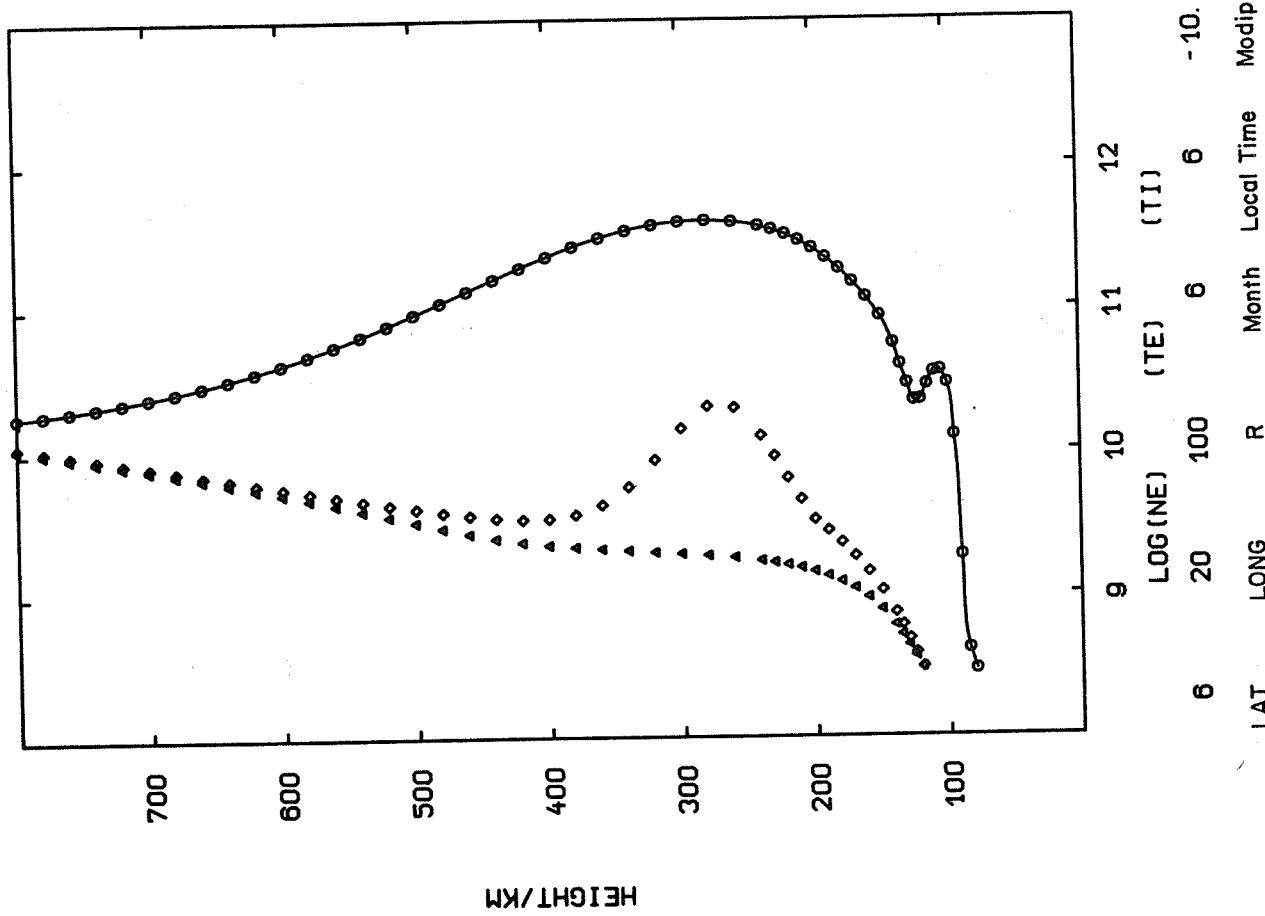
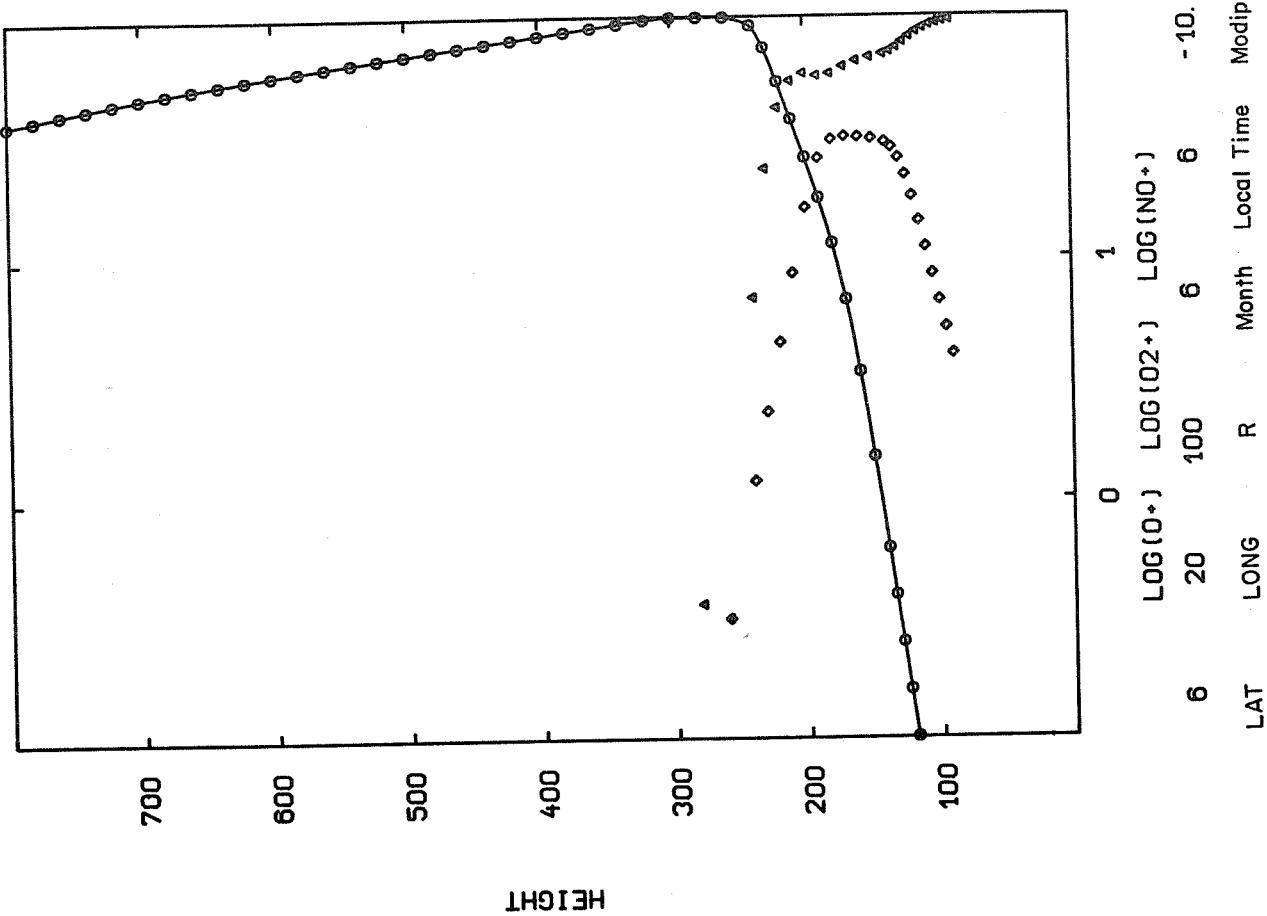


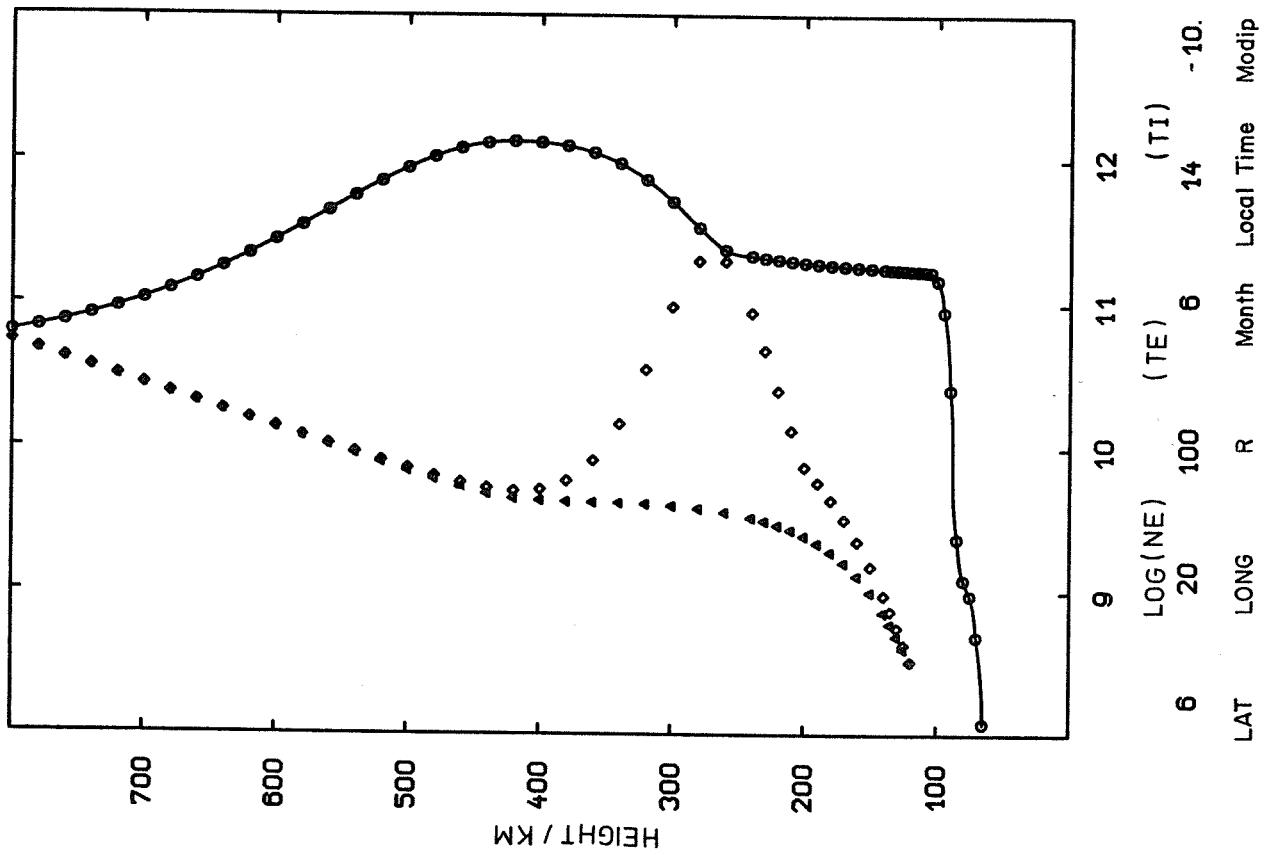
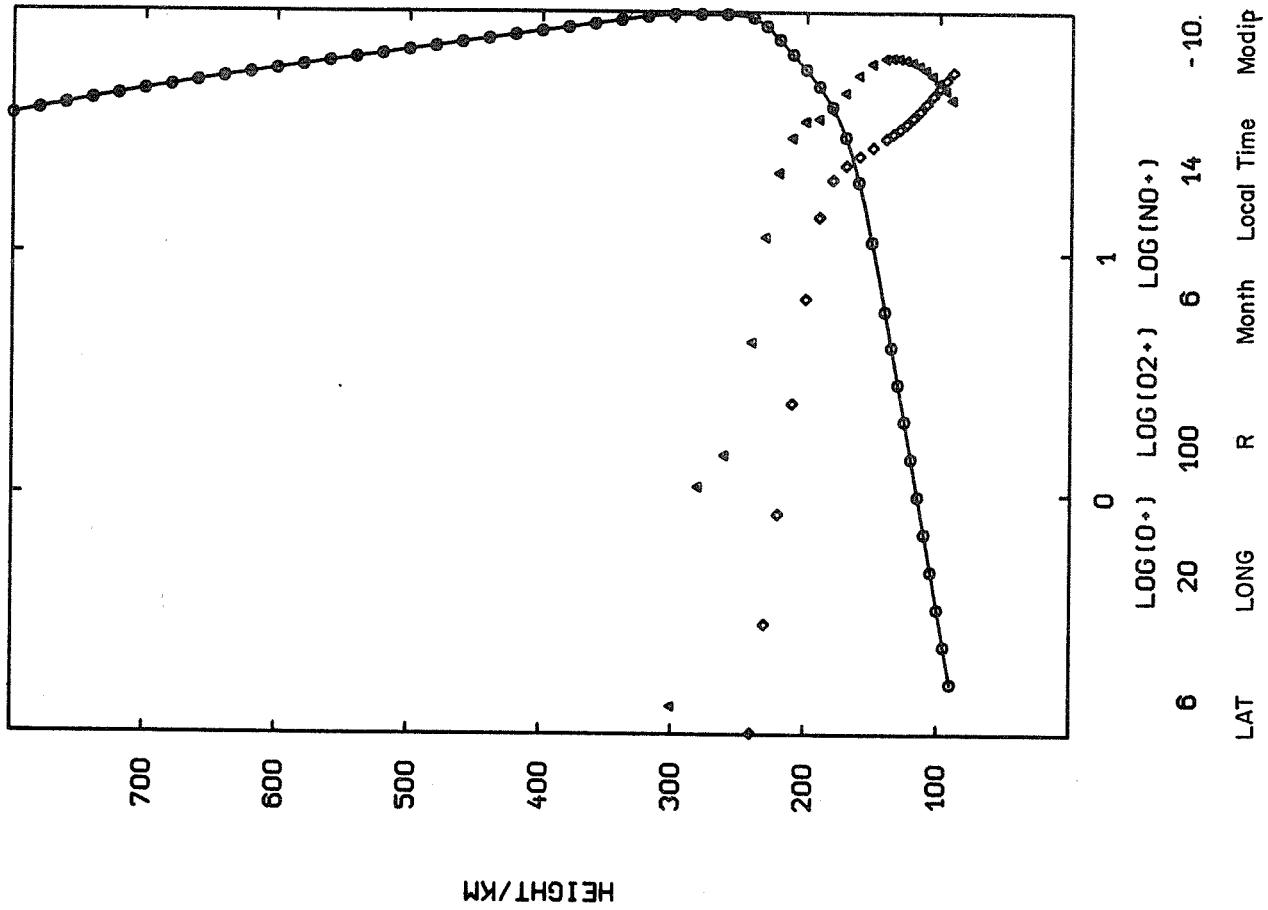
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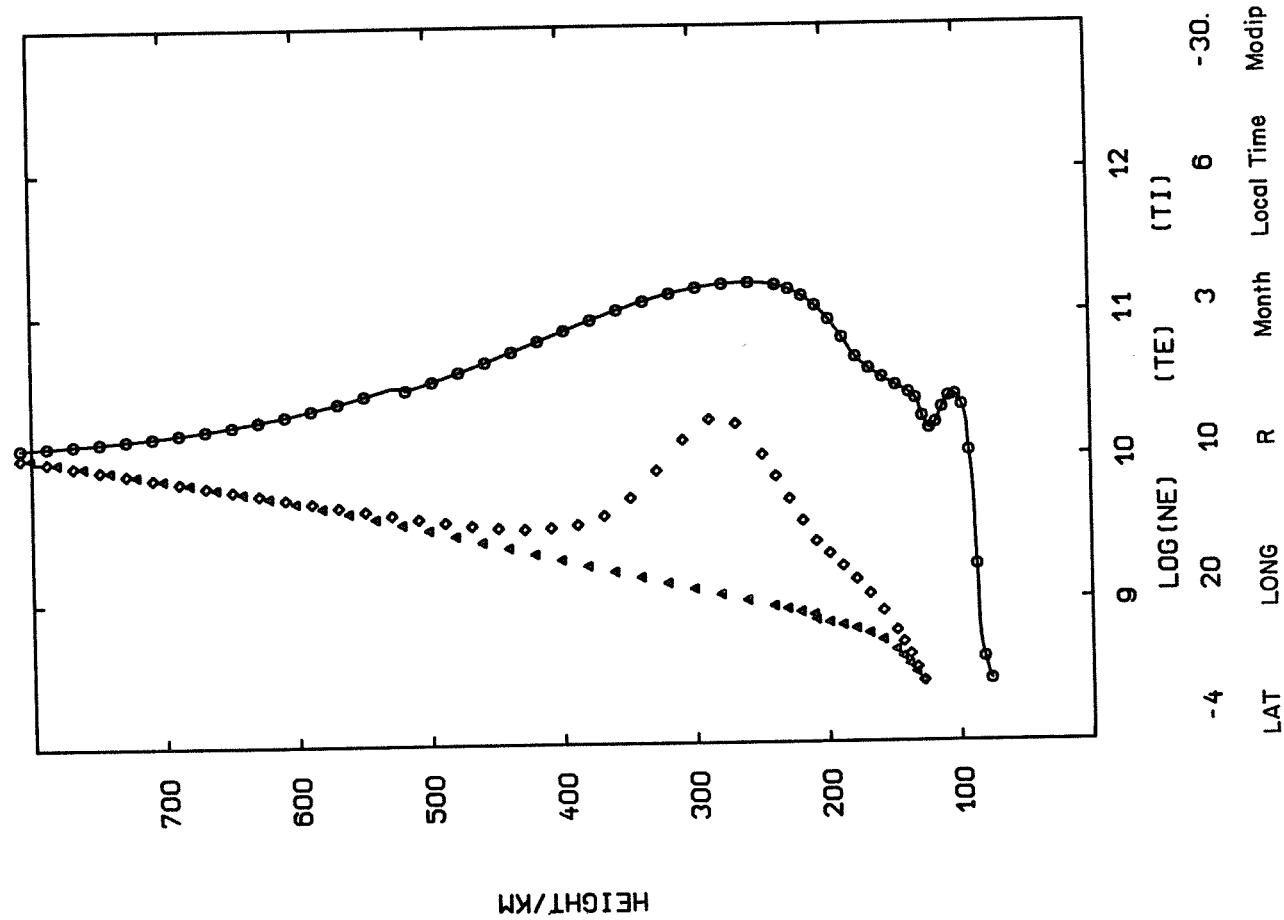
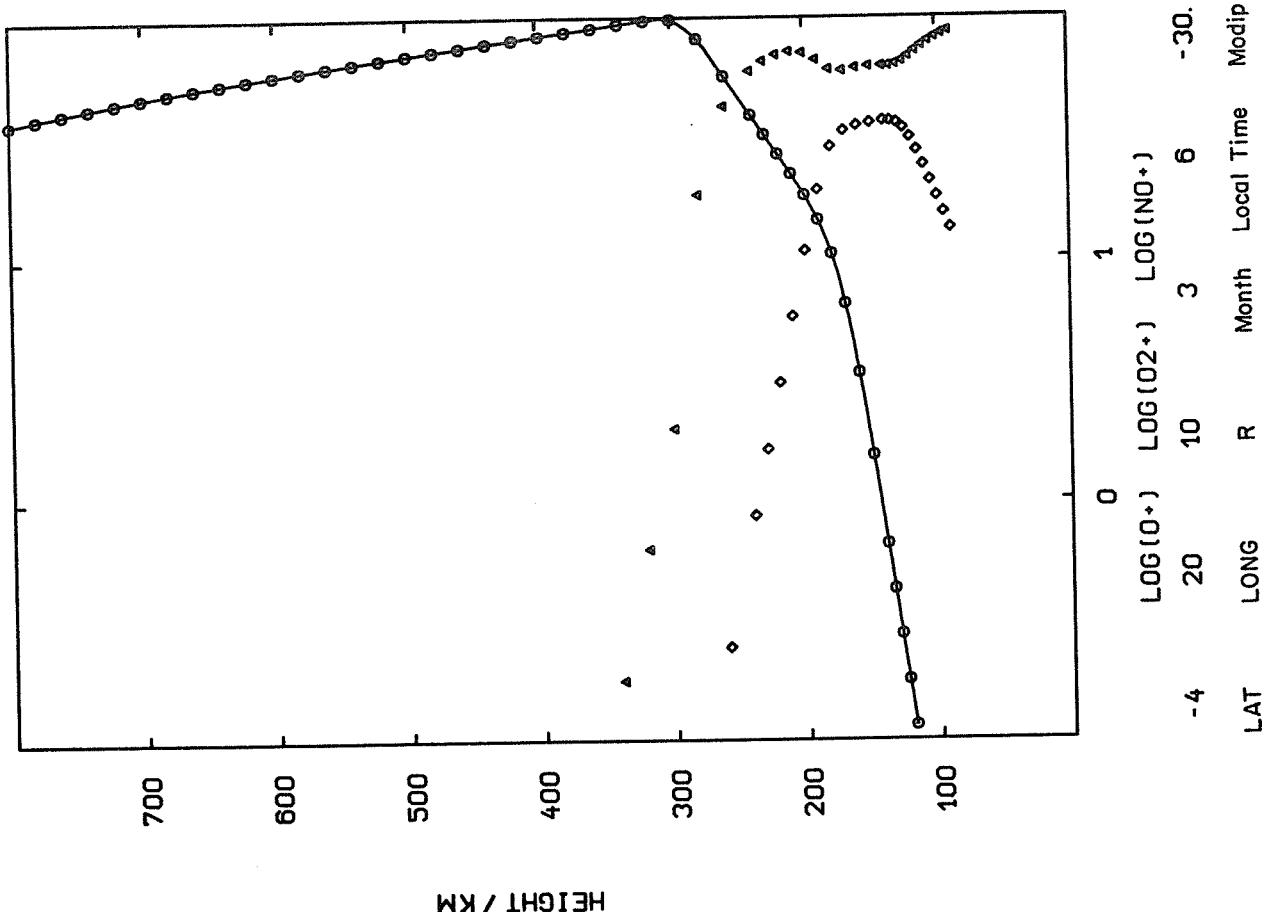


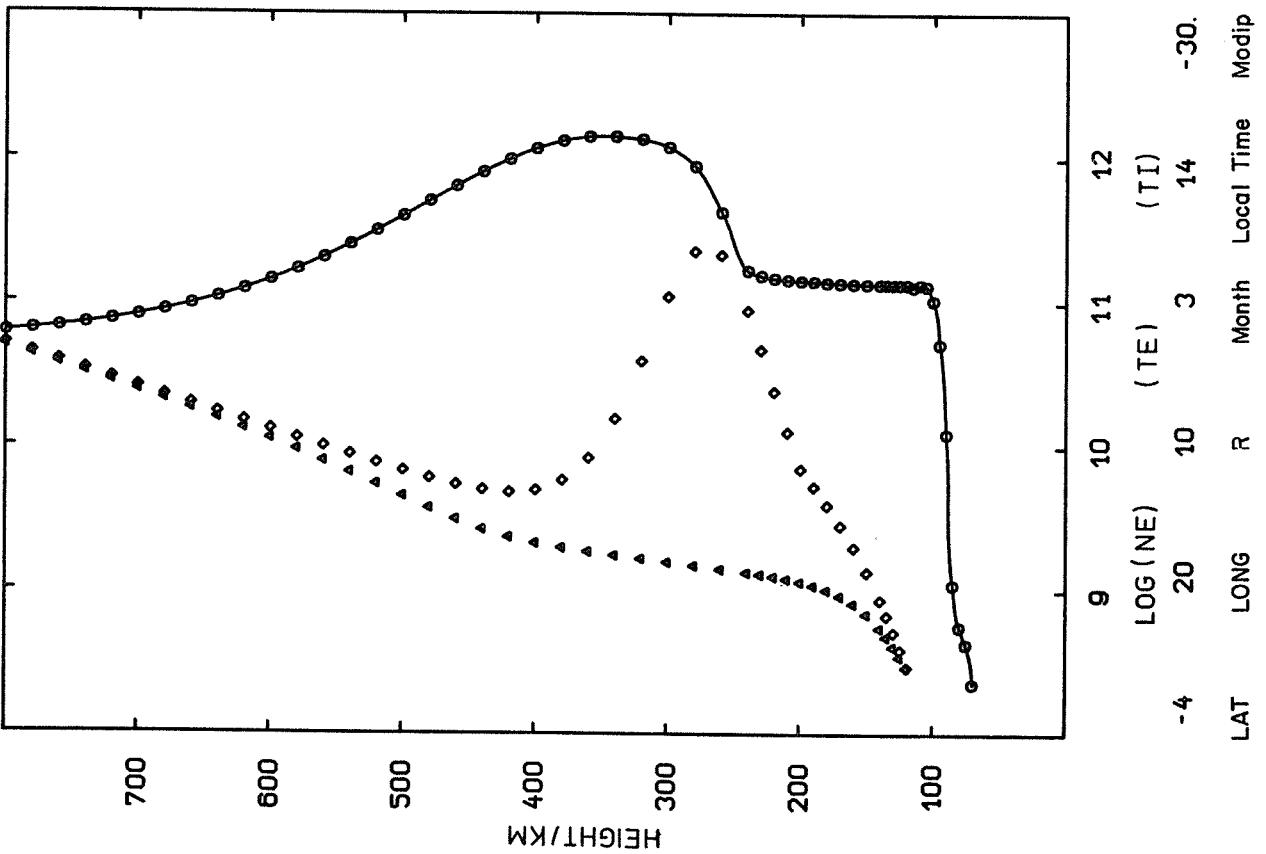
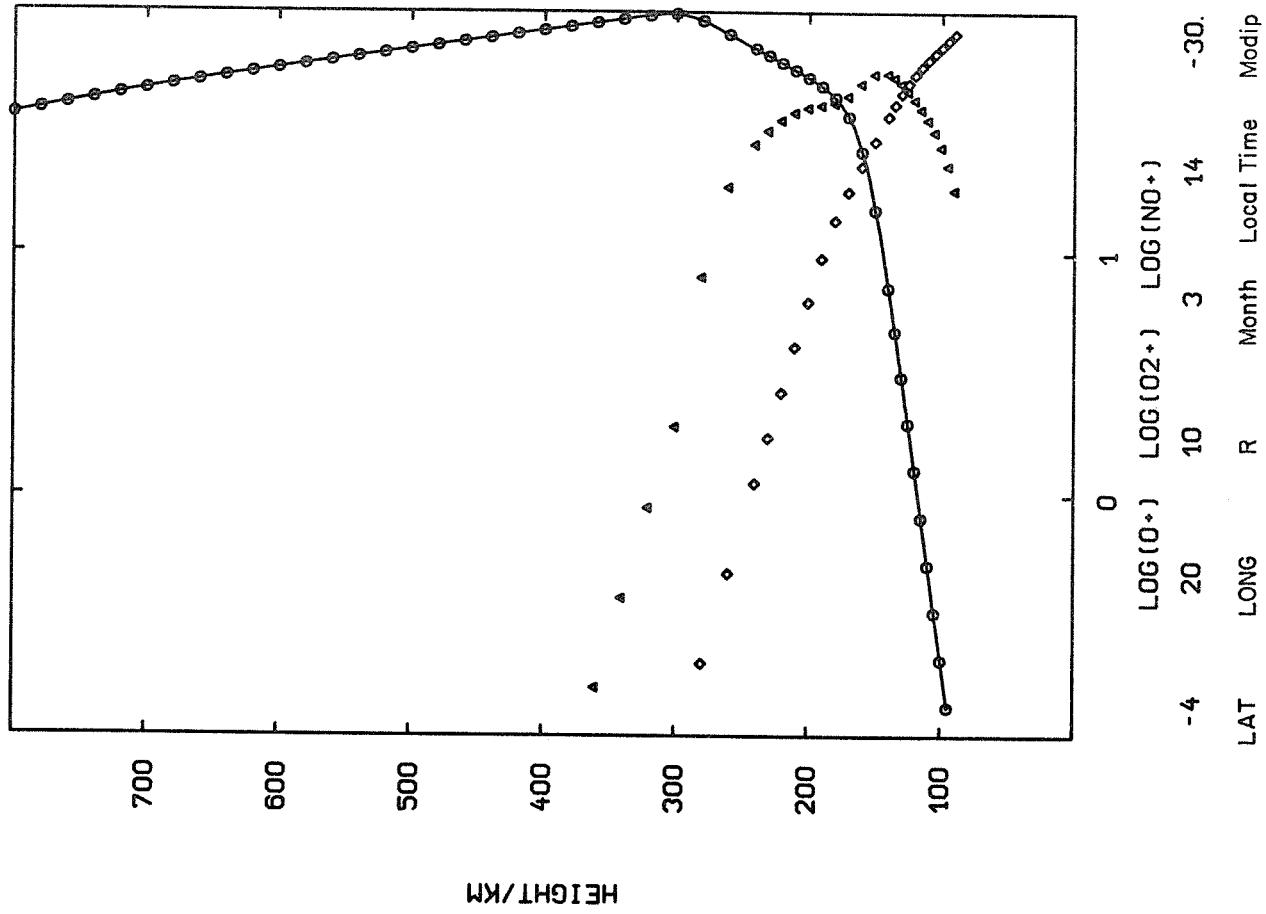
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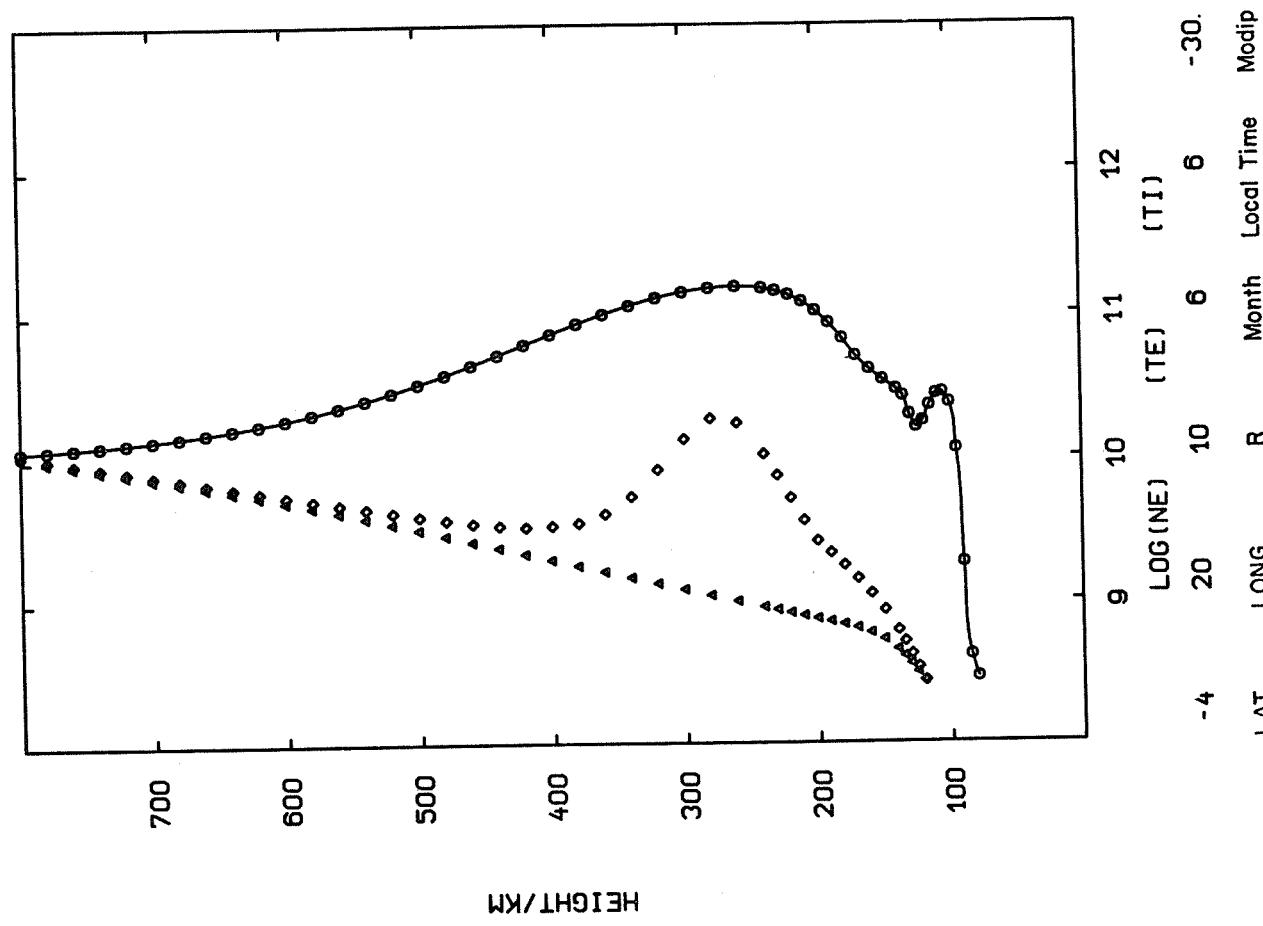
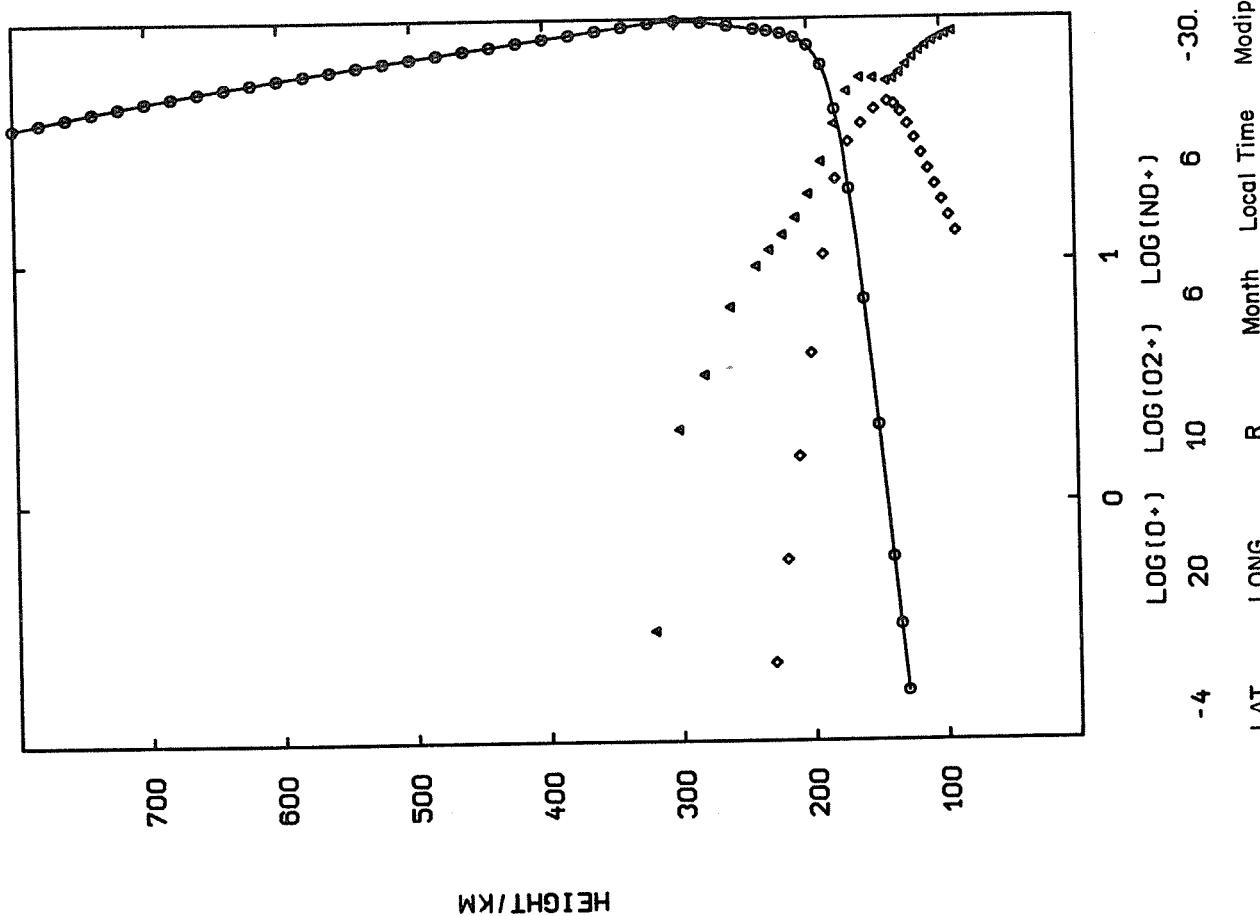


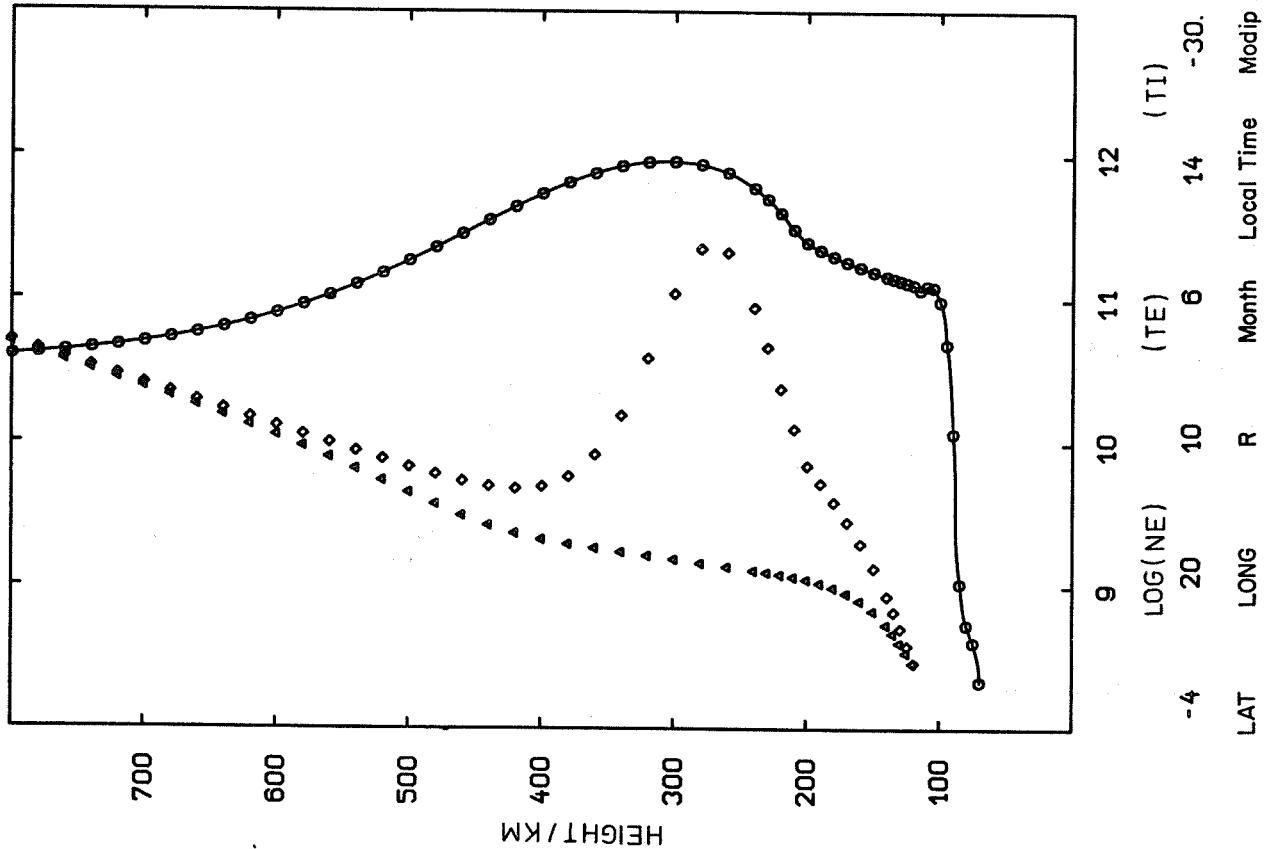
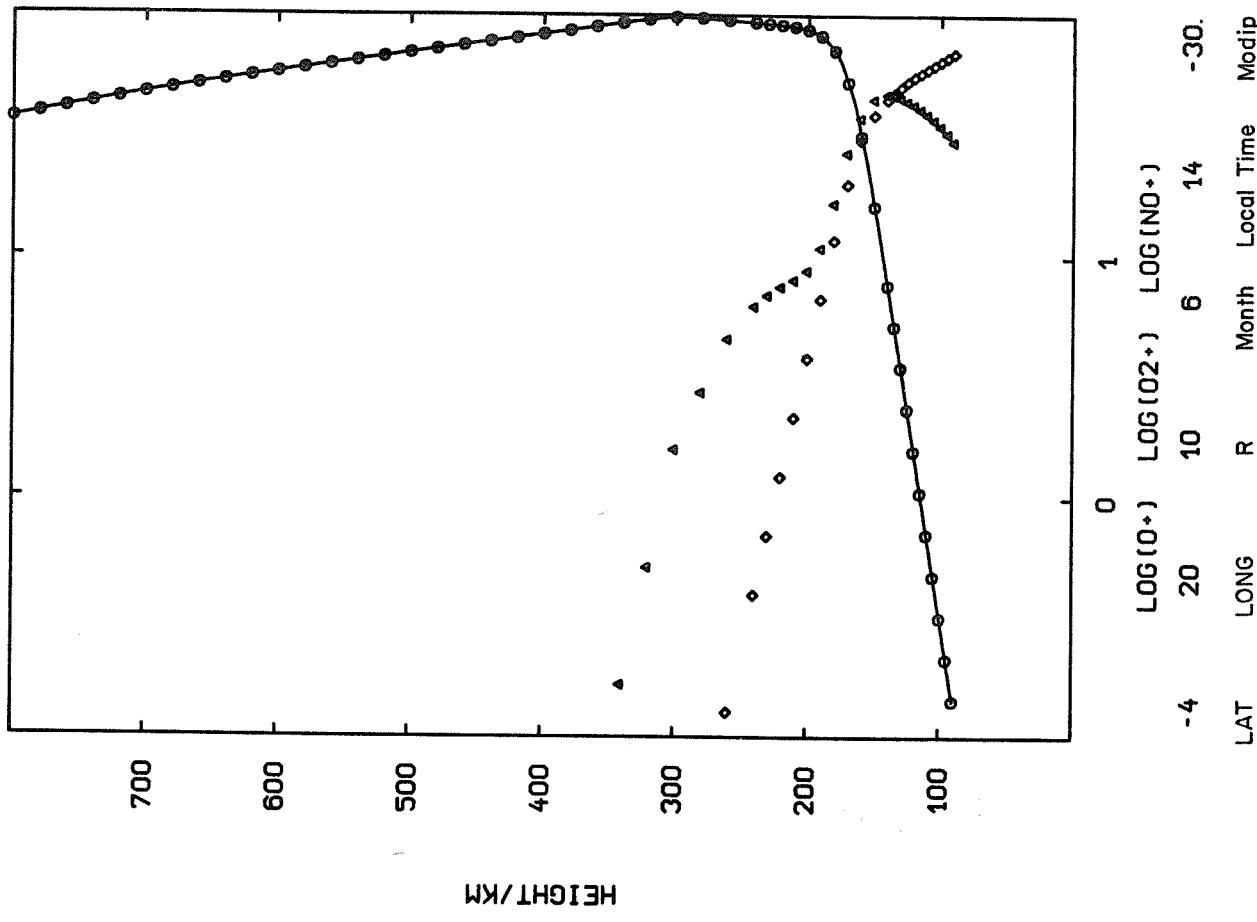


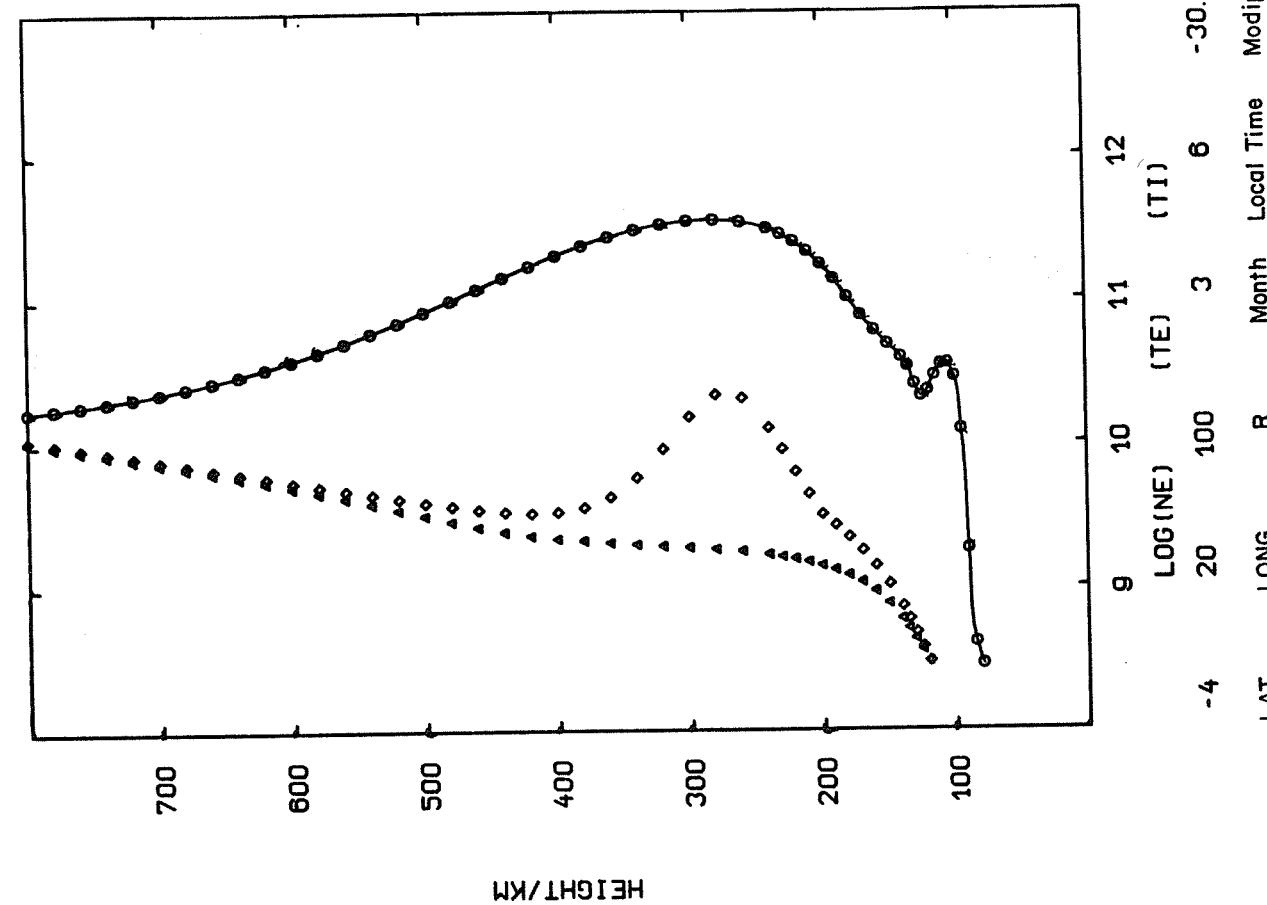
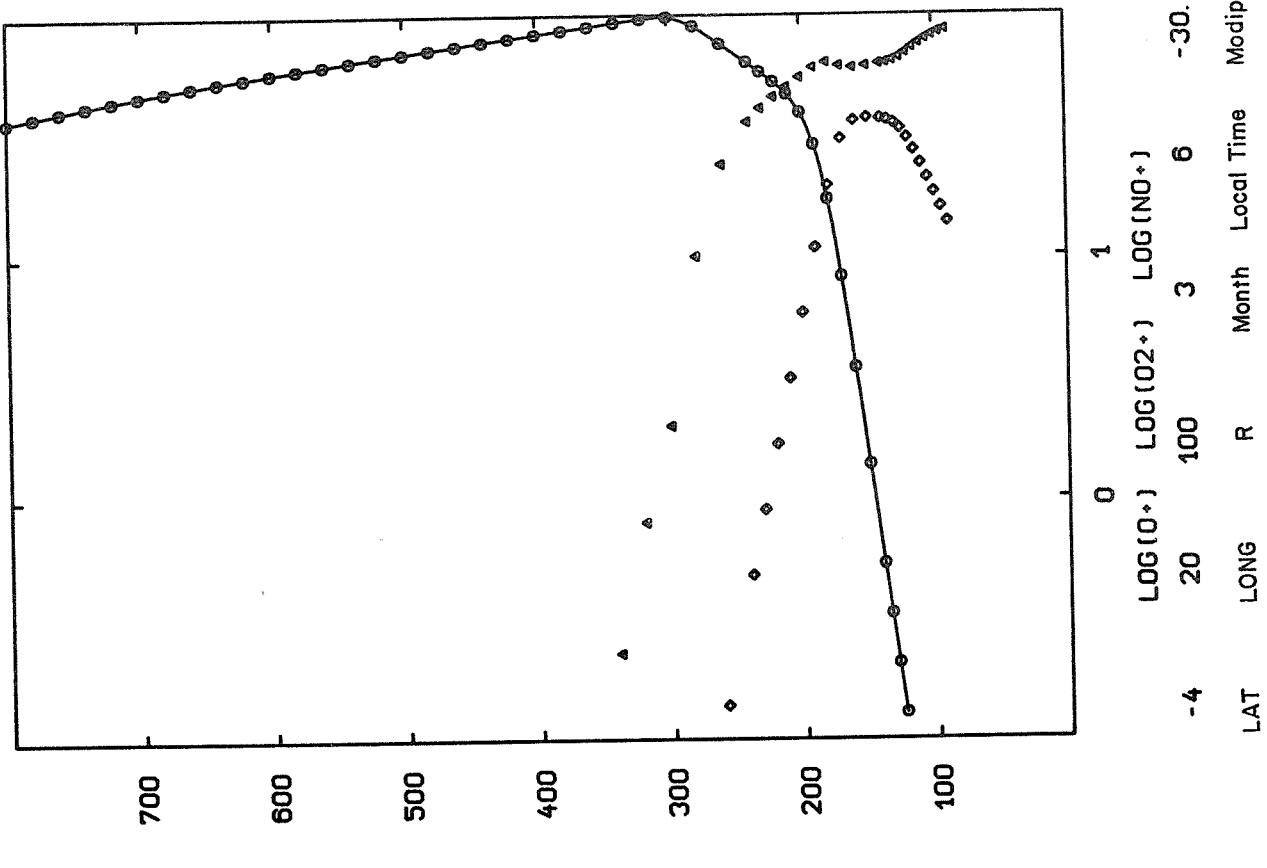


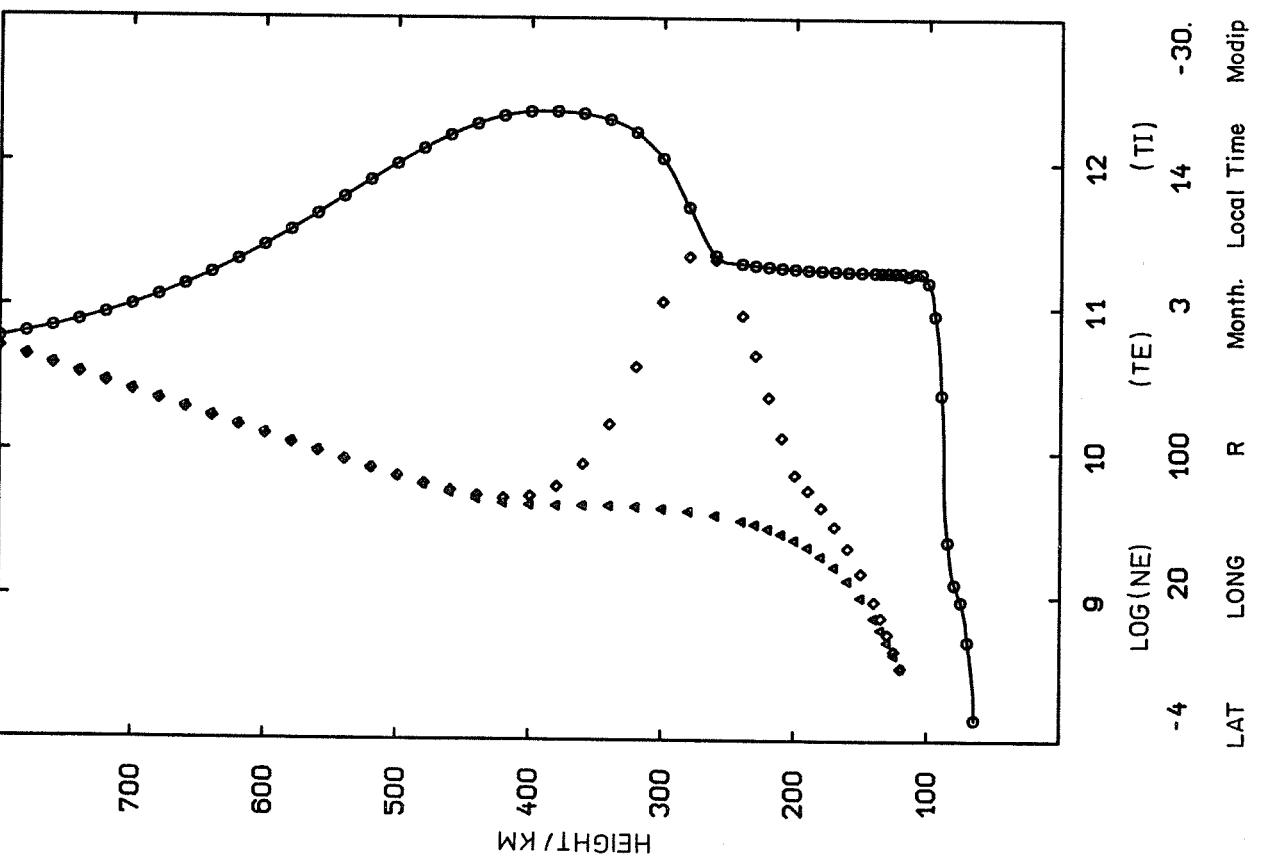
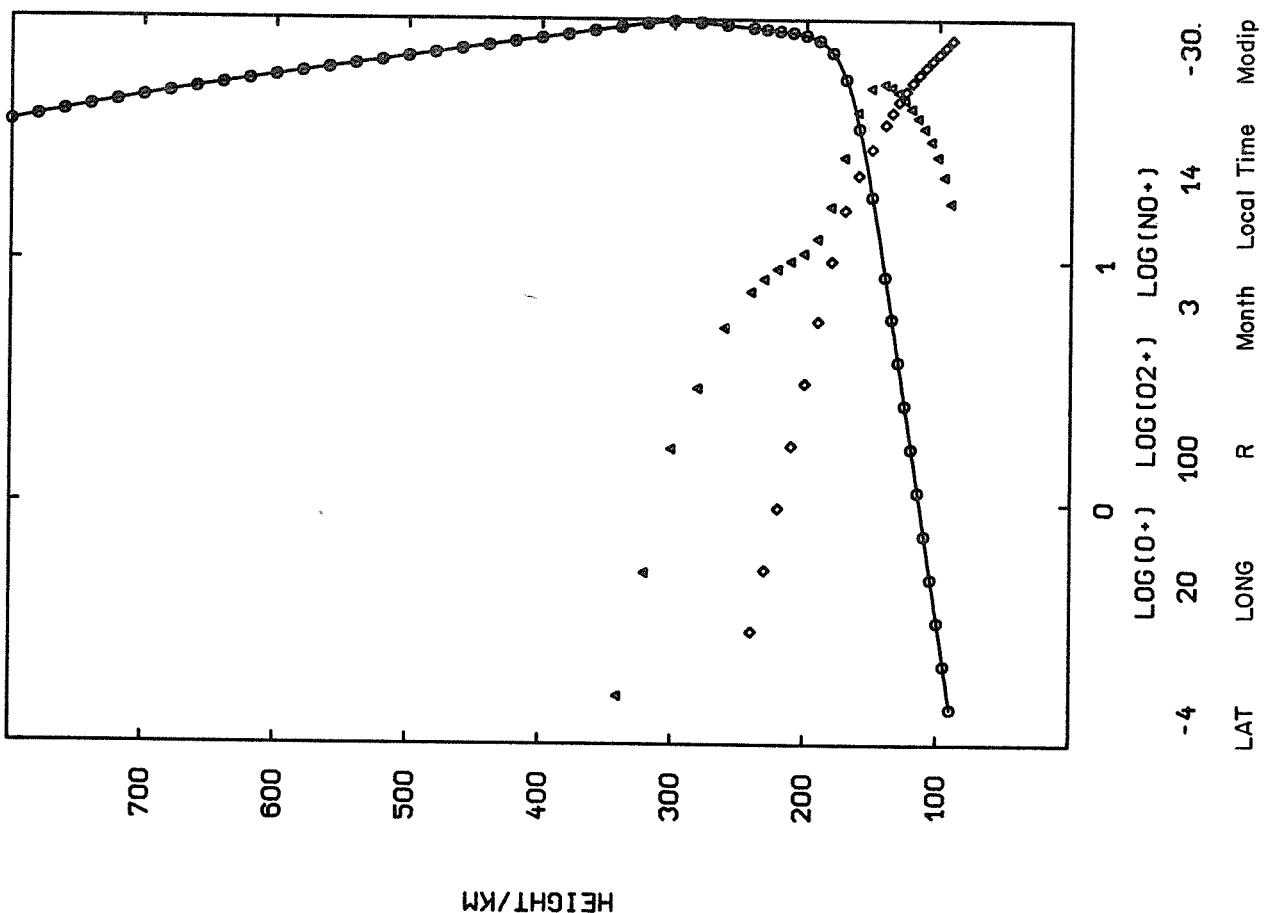


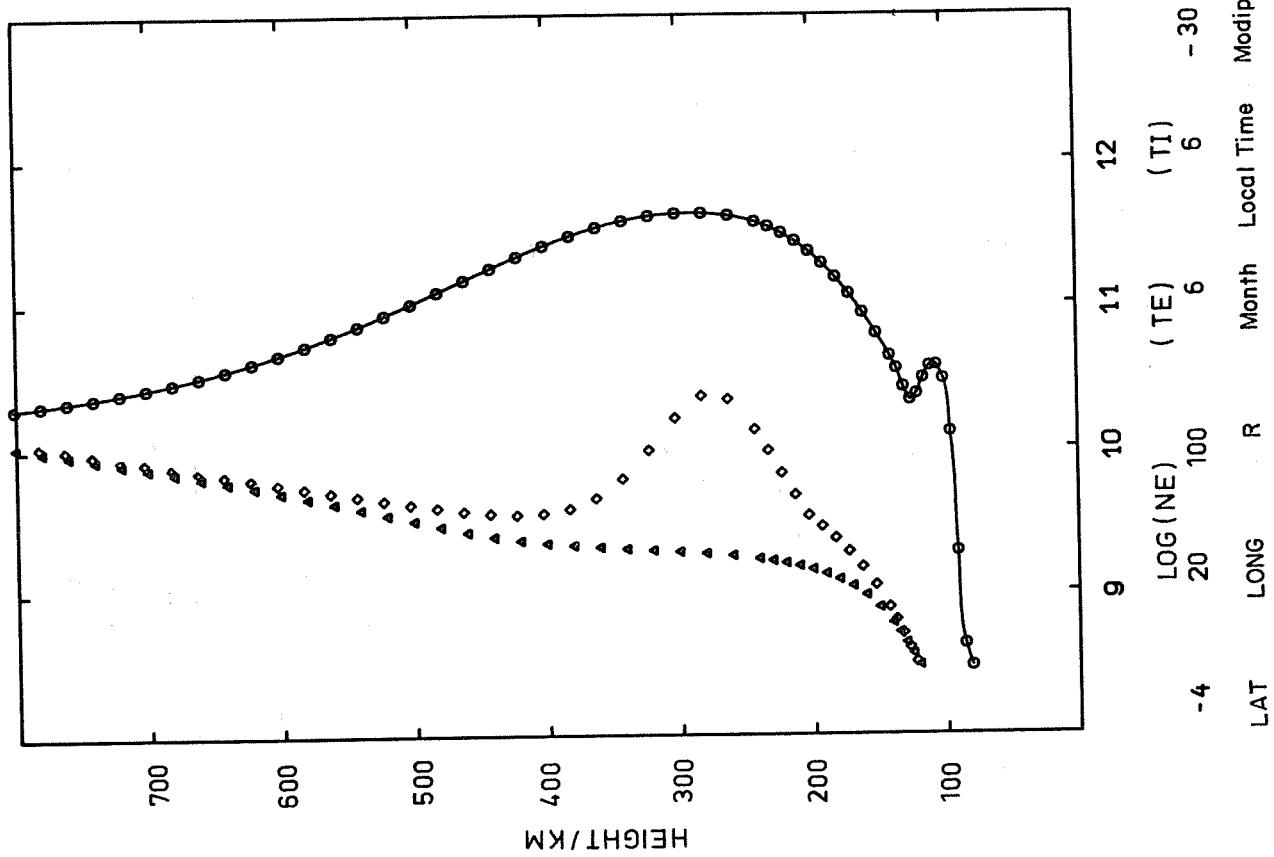
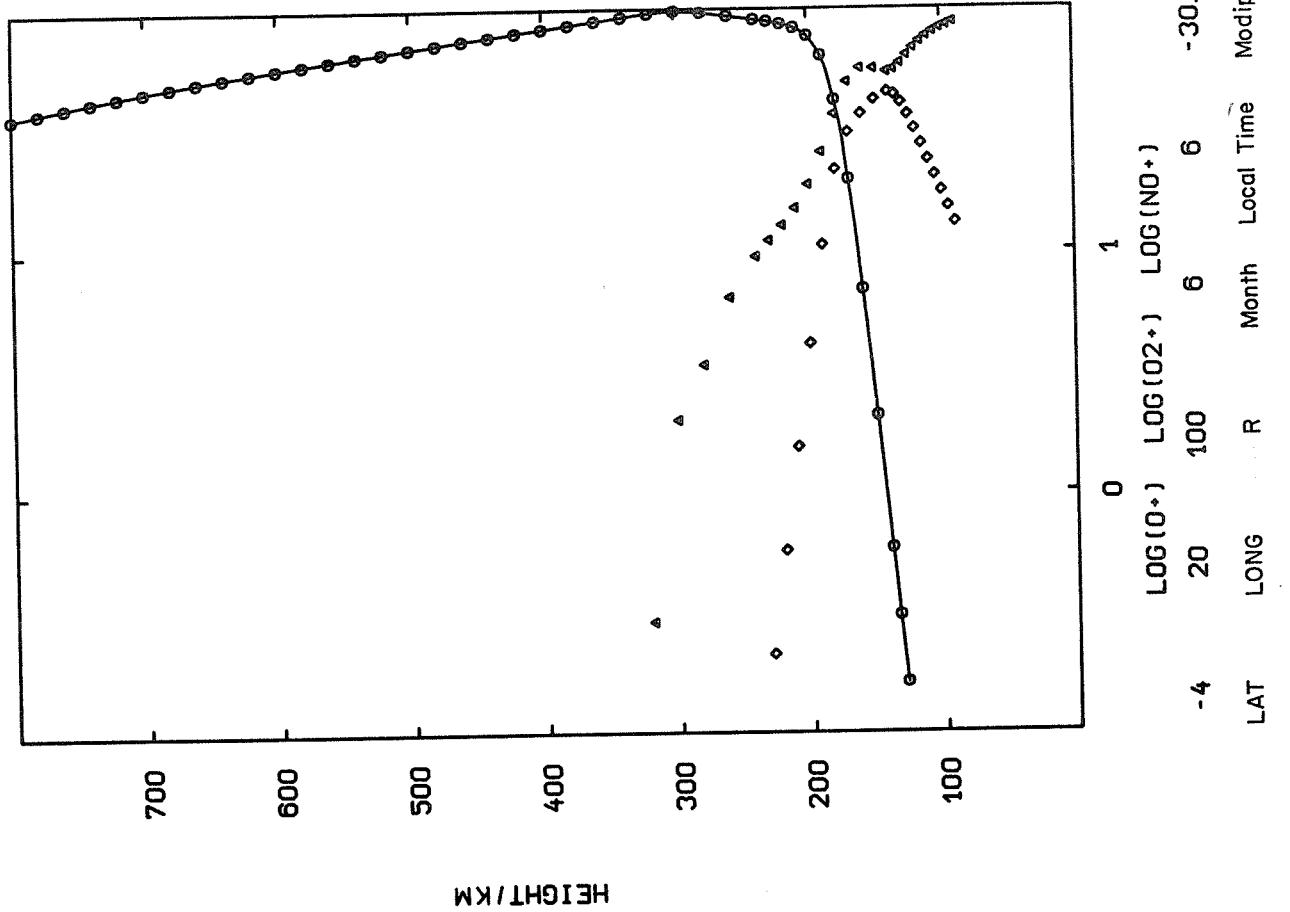


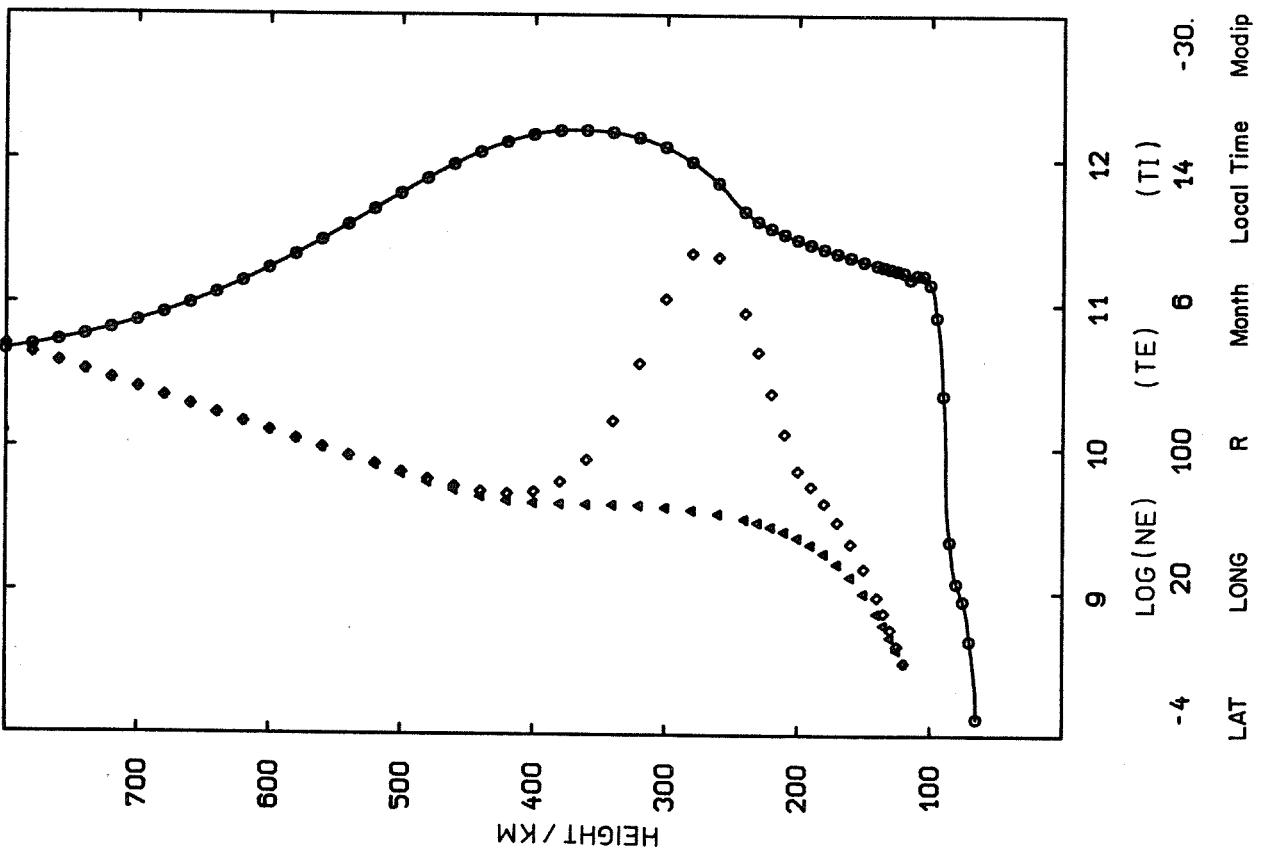
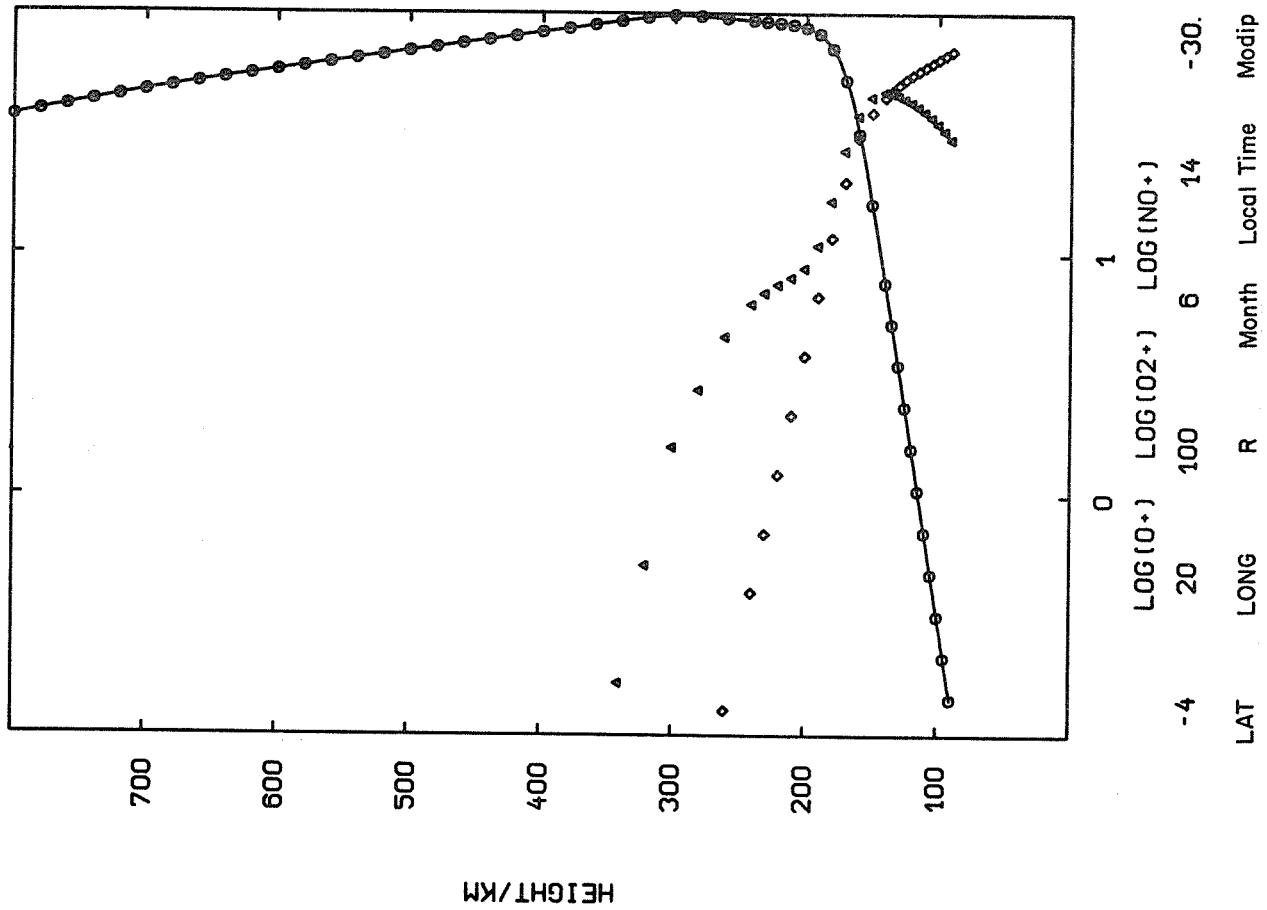


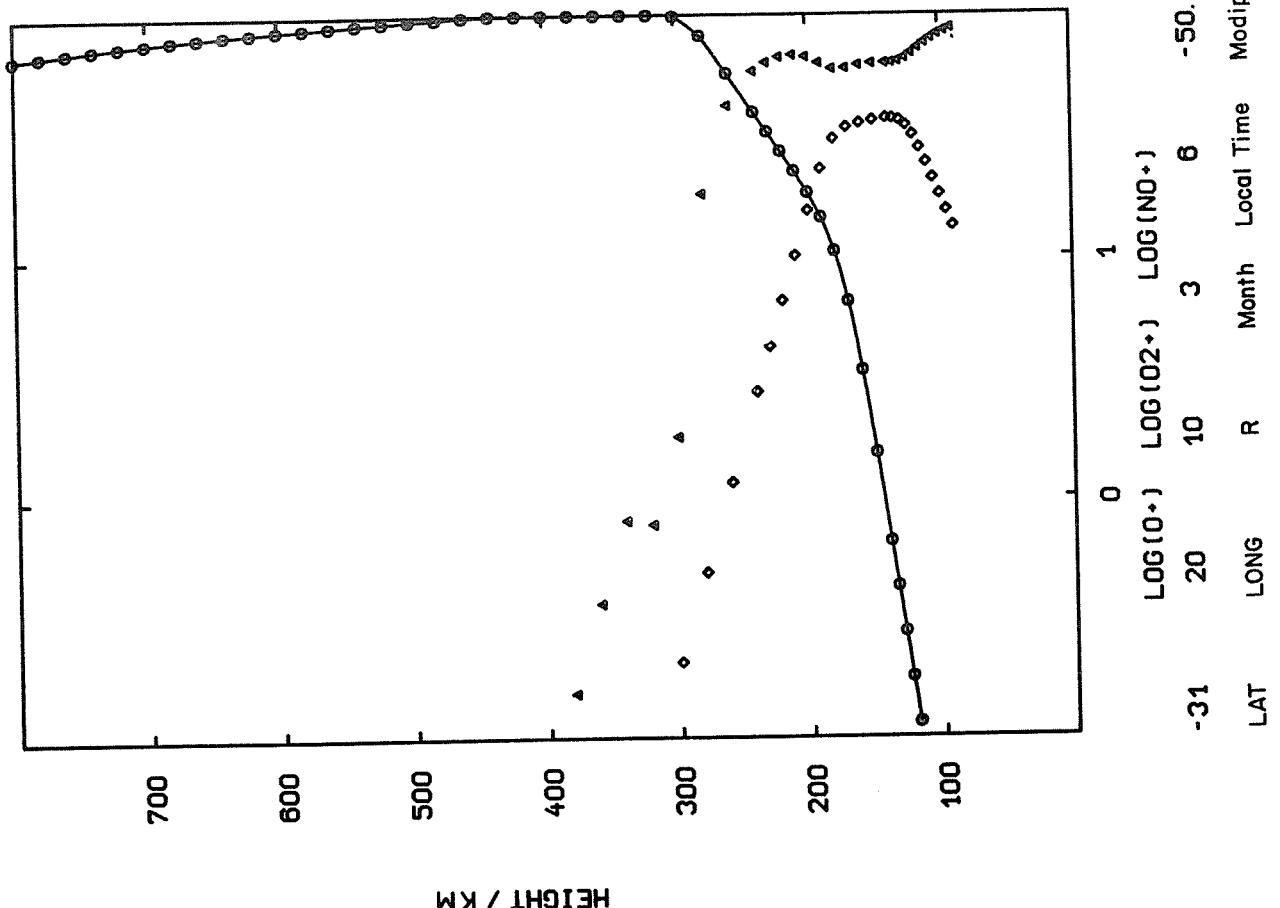




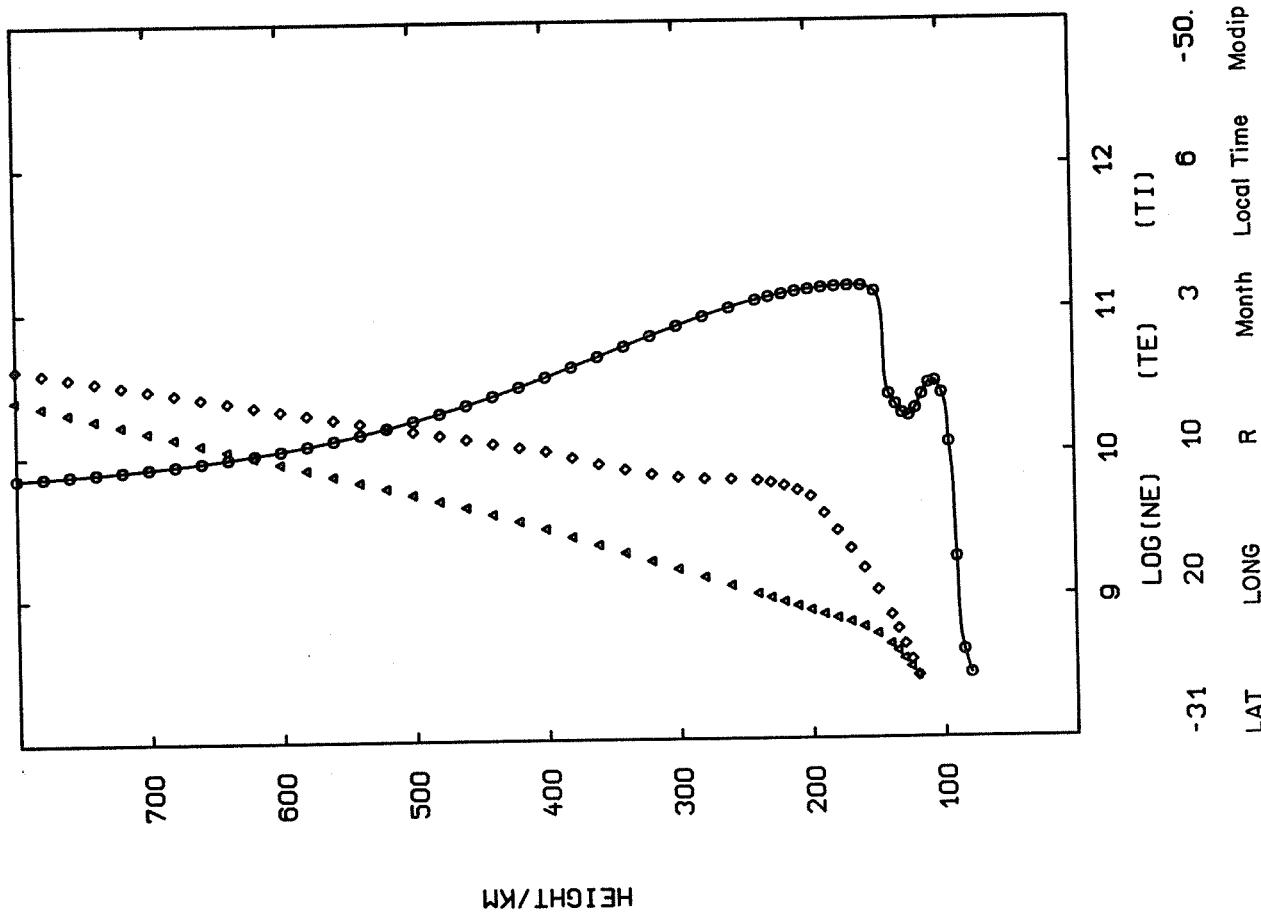




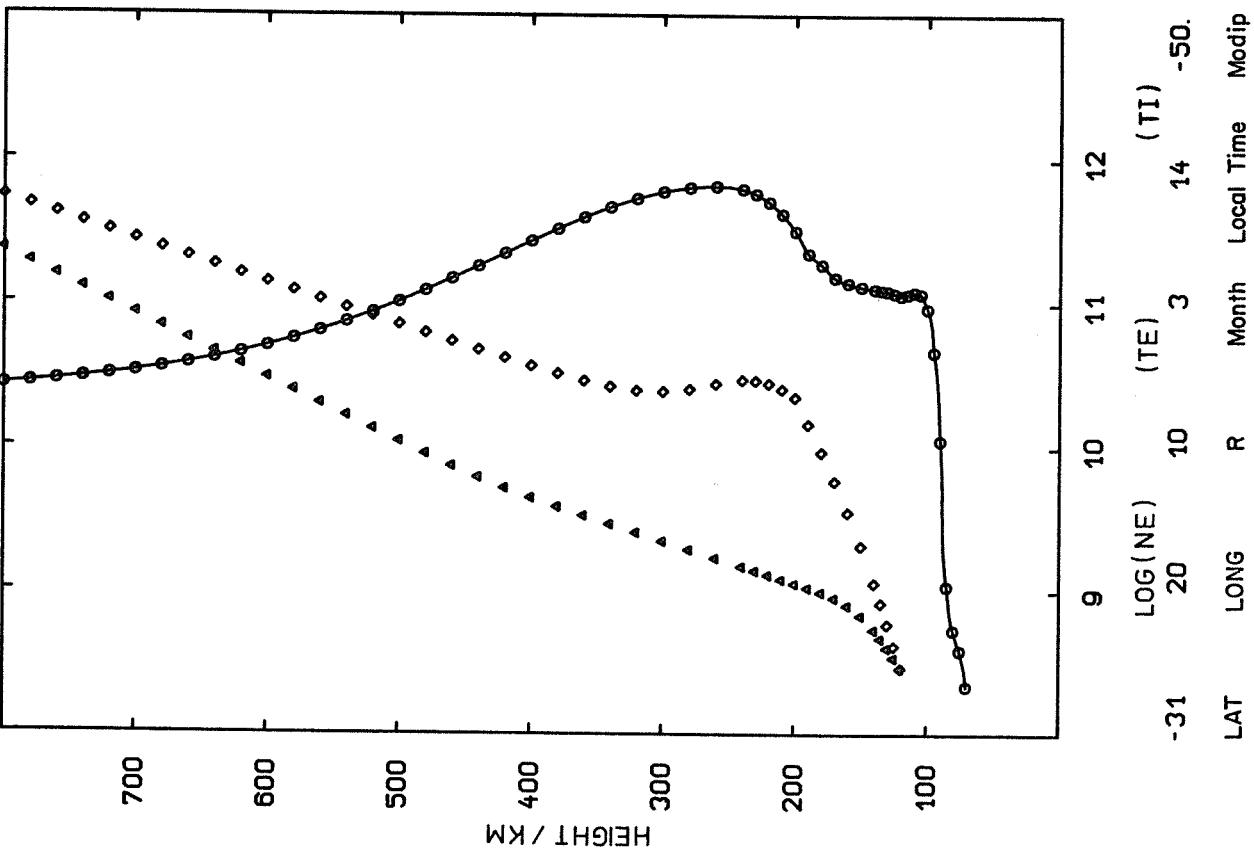
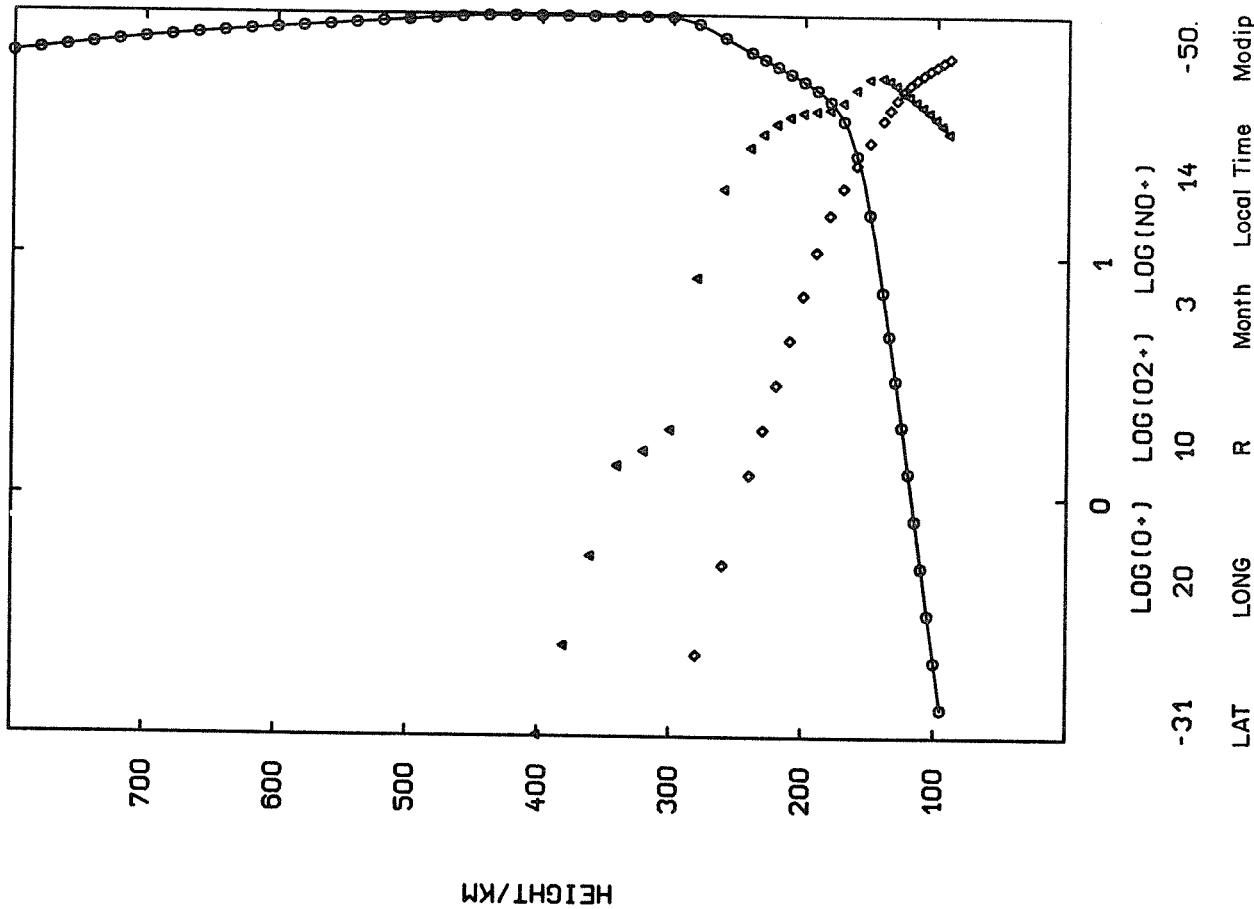


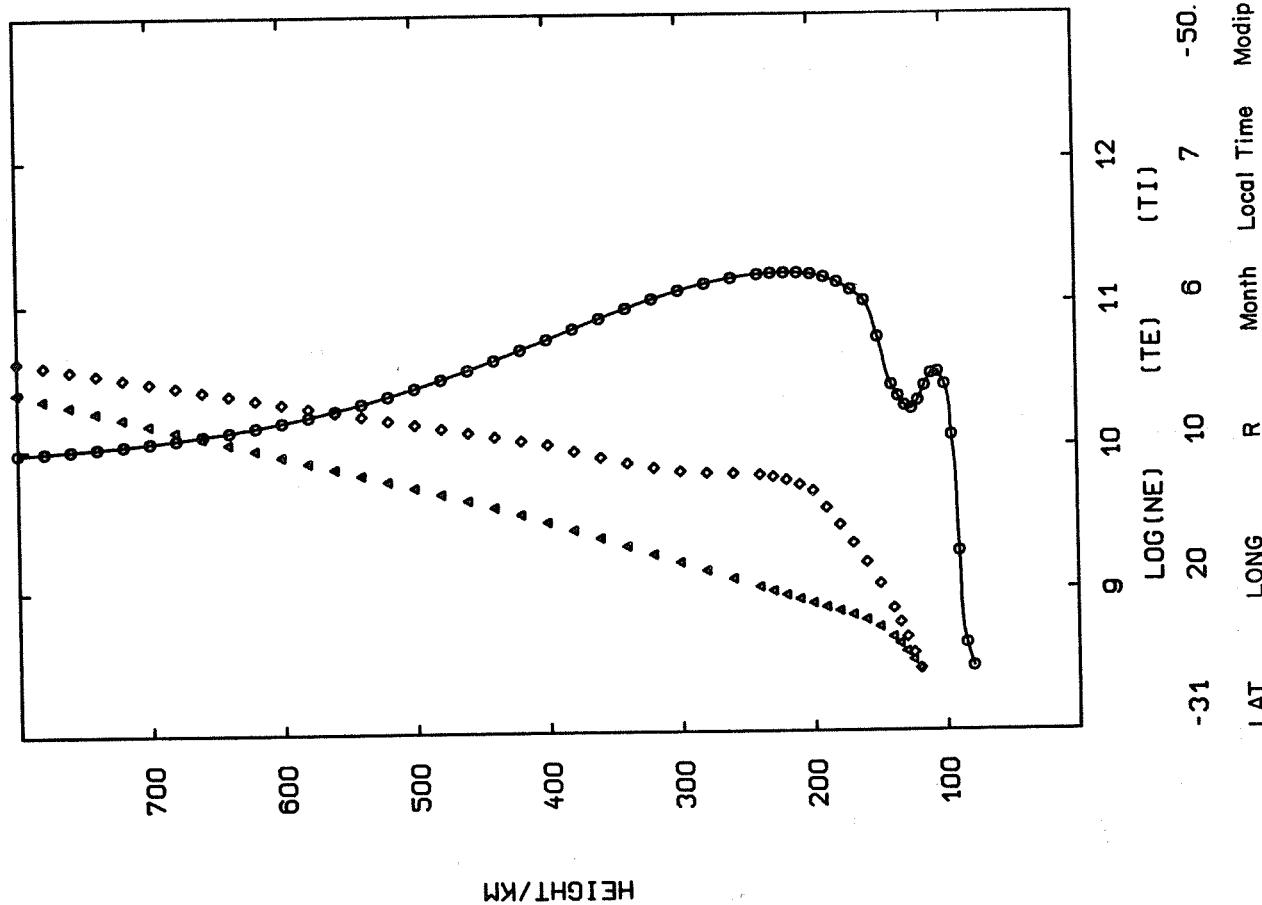
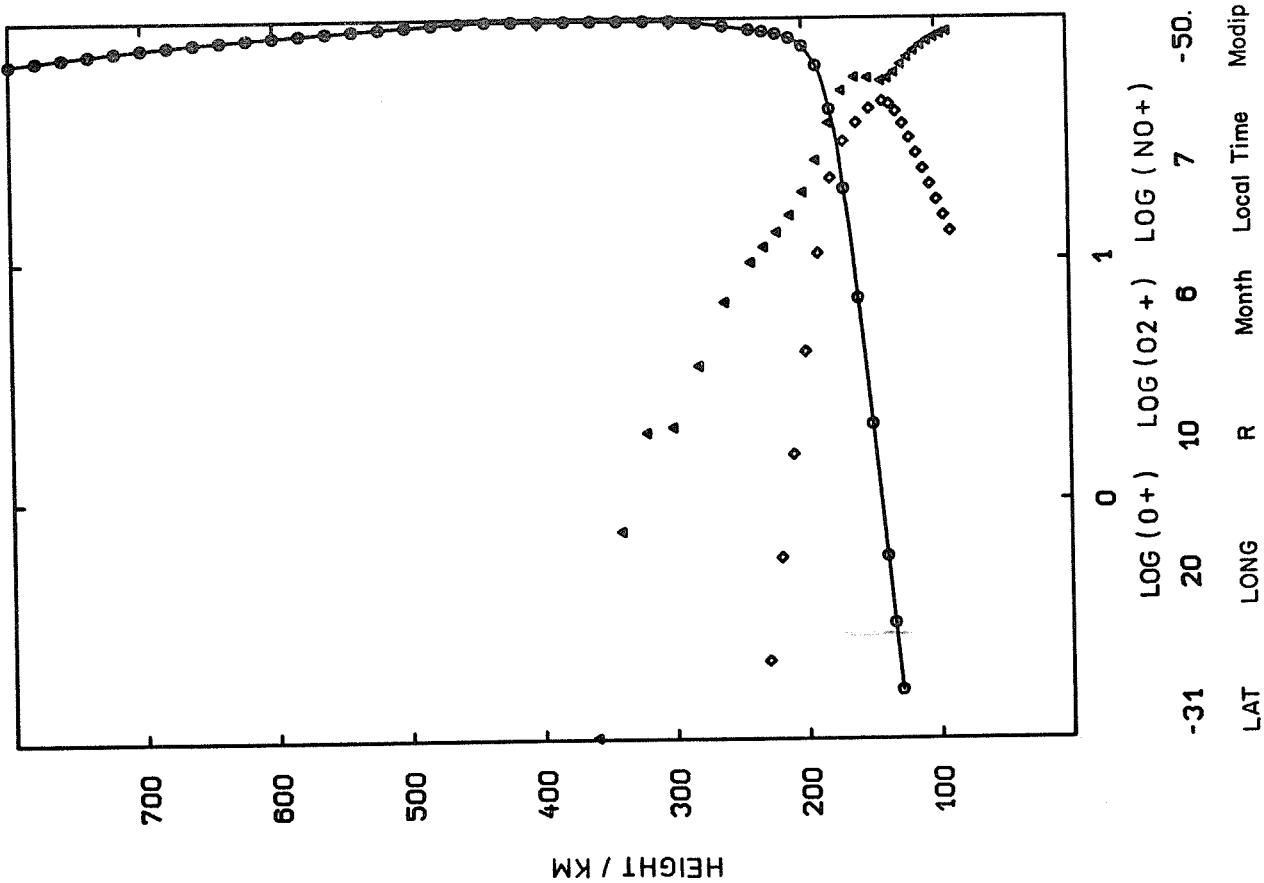


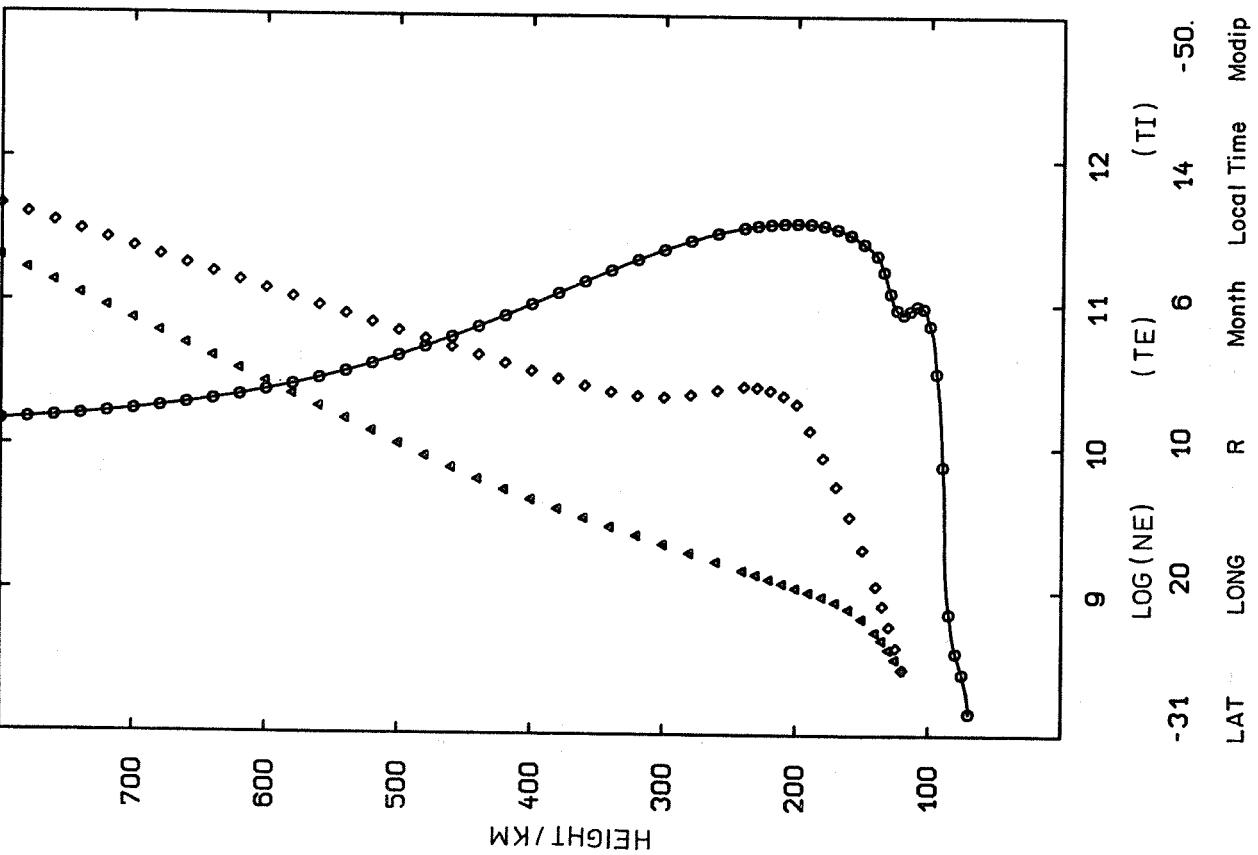
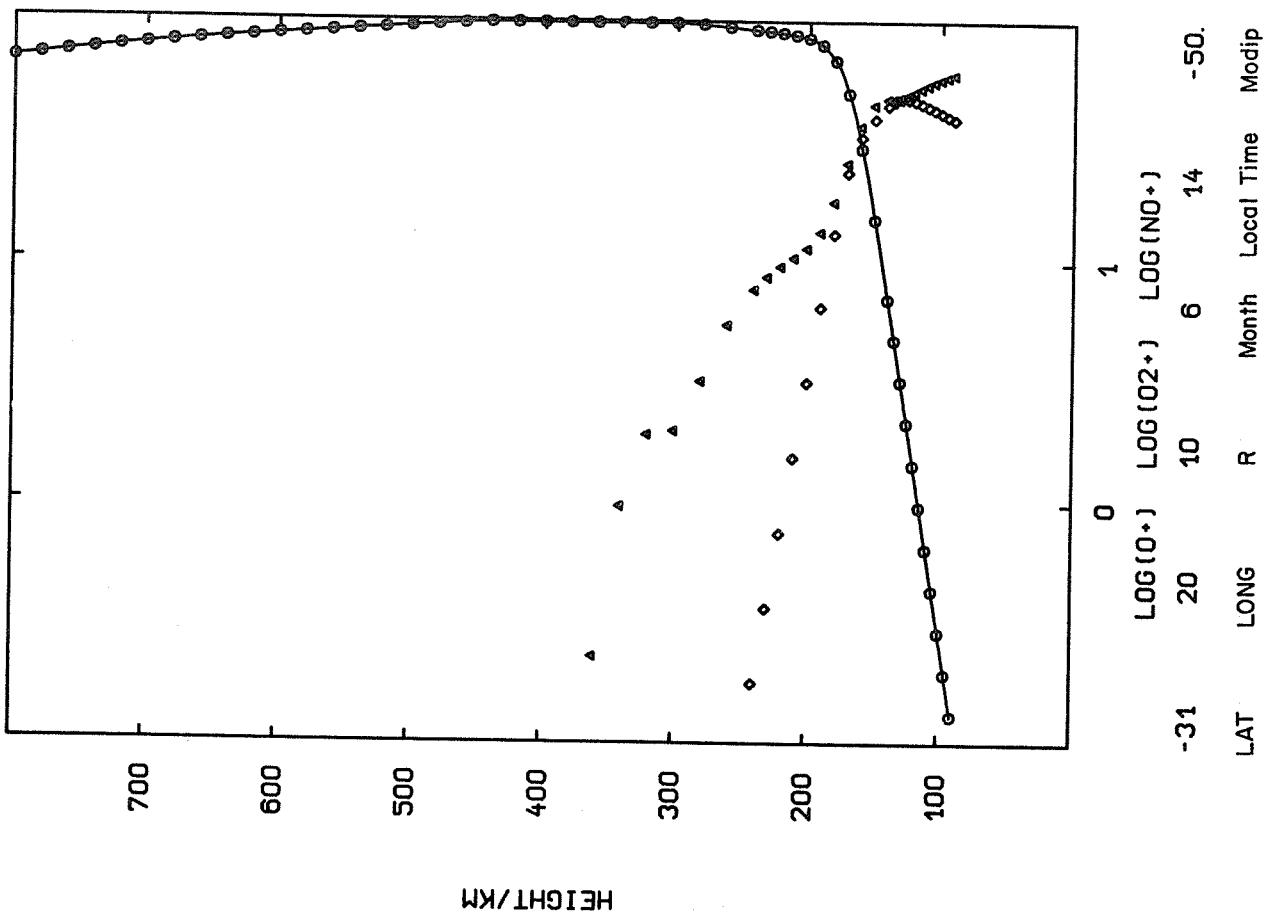
HEIGHT / KM

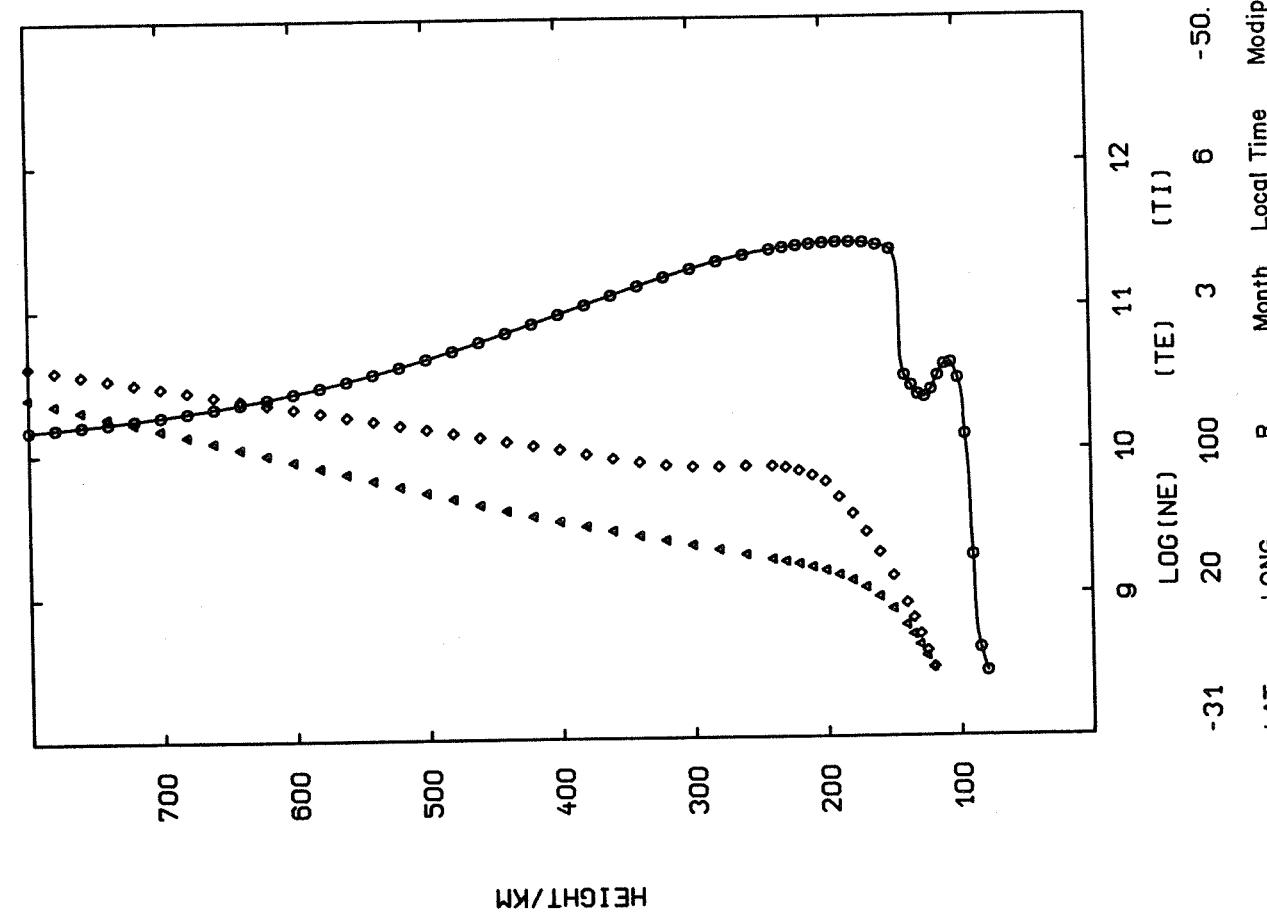
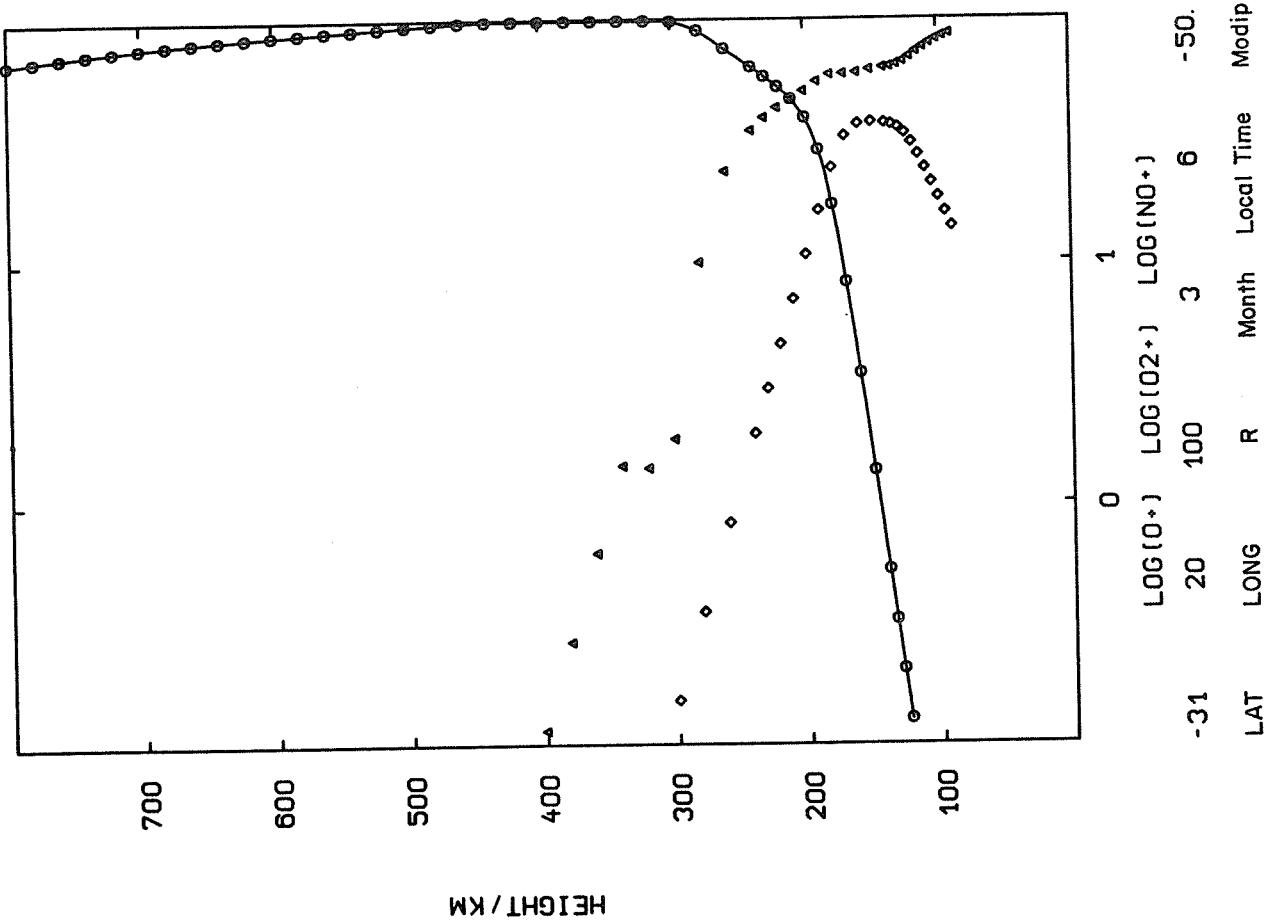


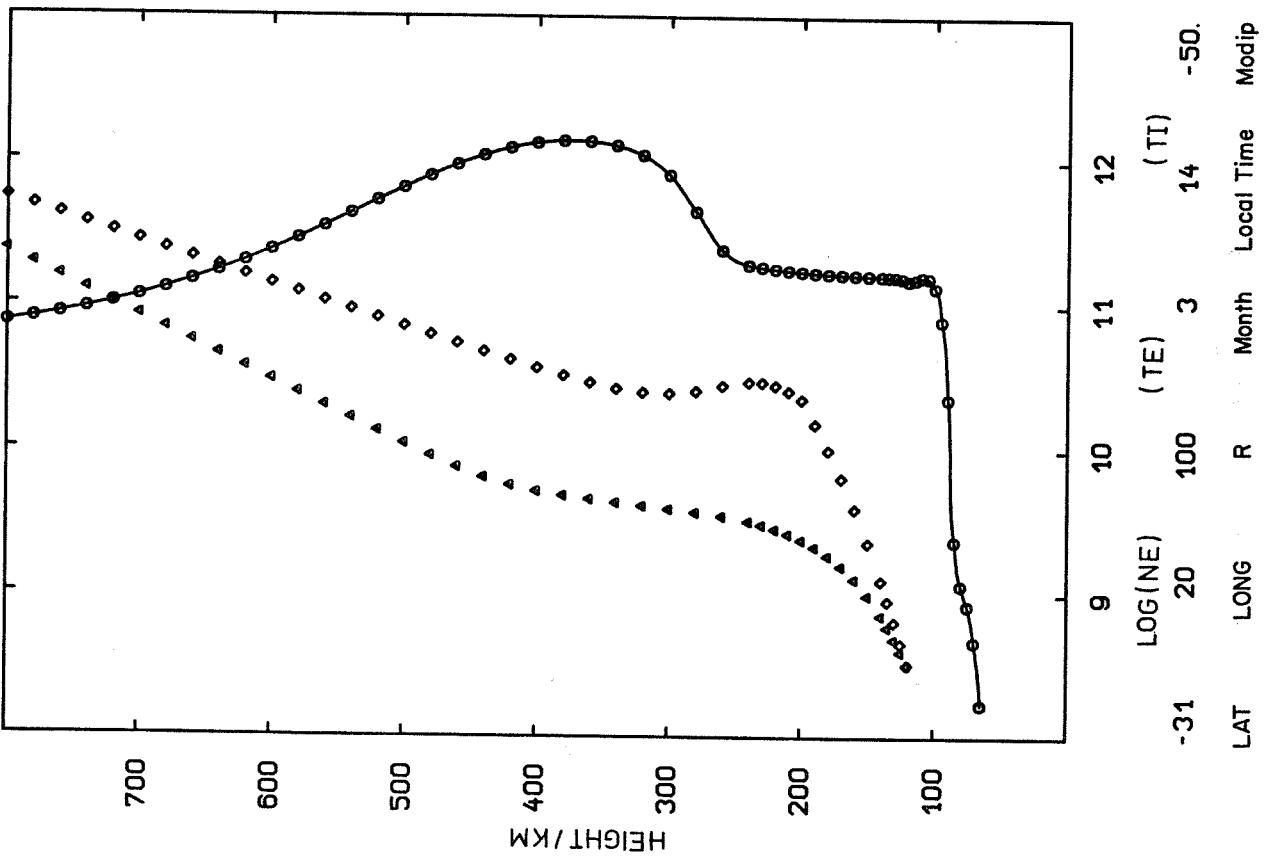
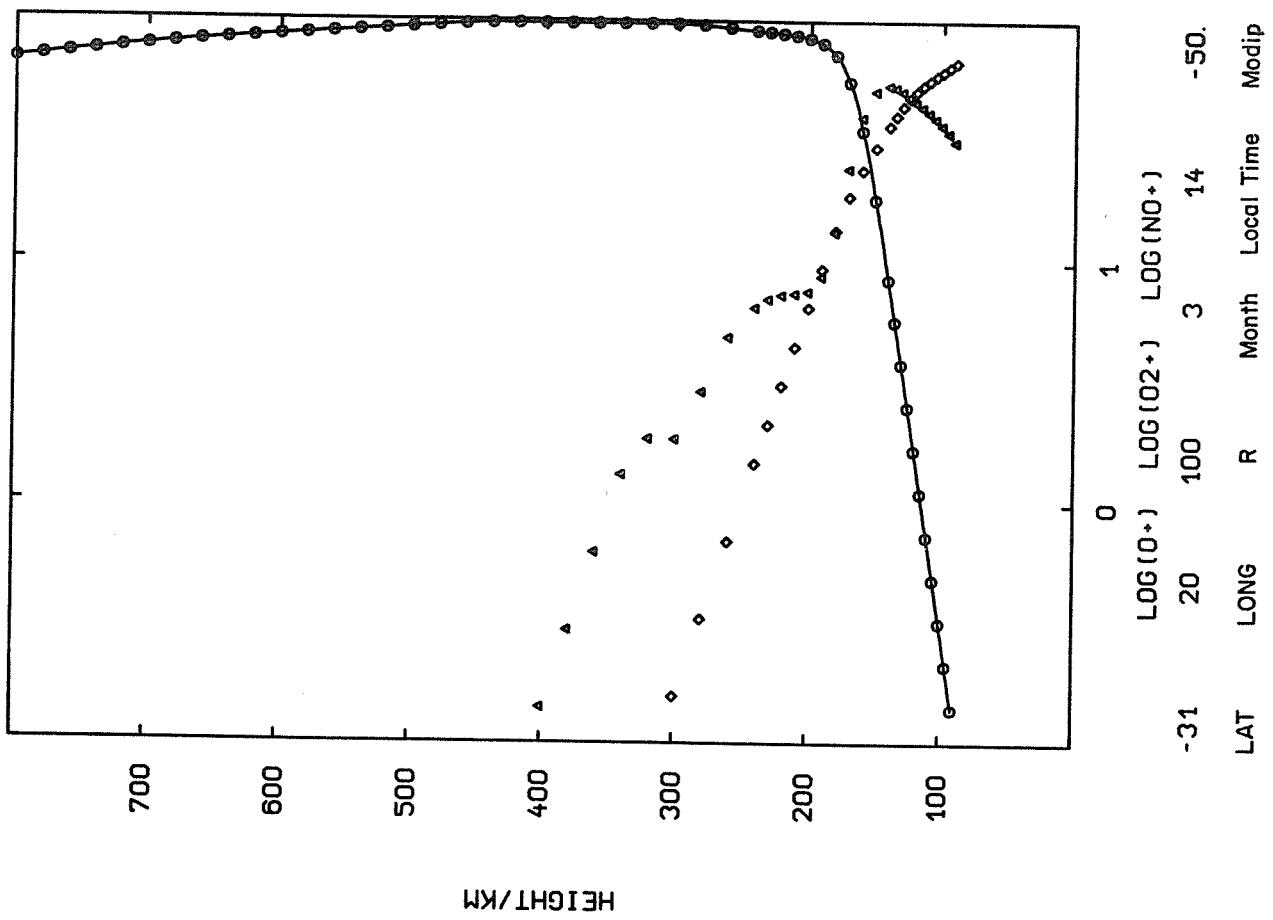
HEIGHT / KM

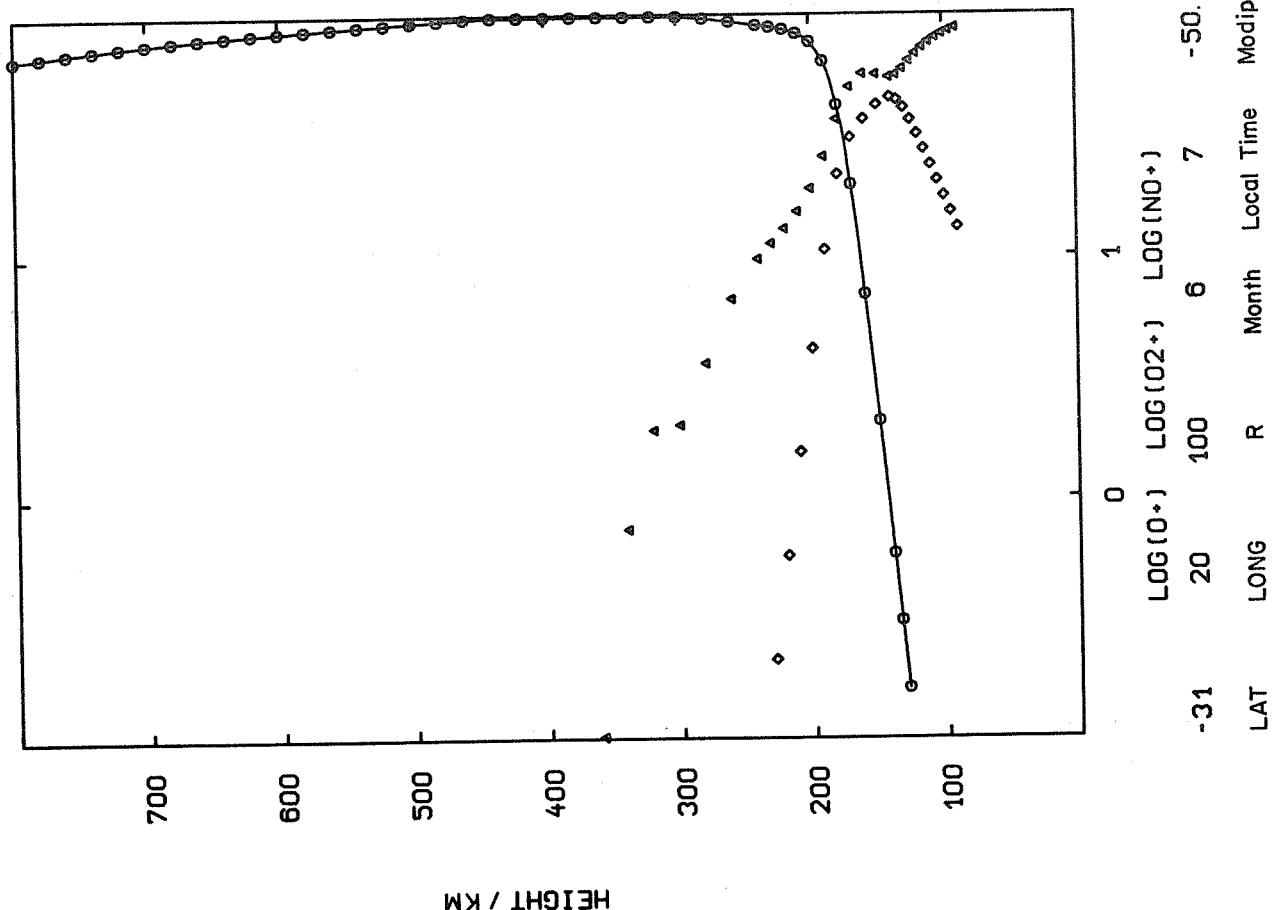




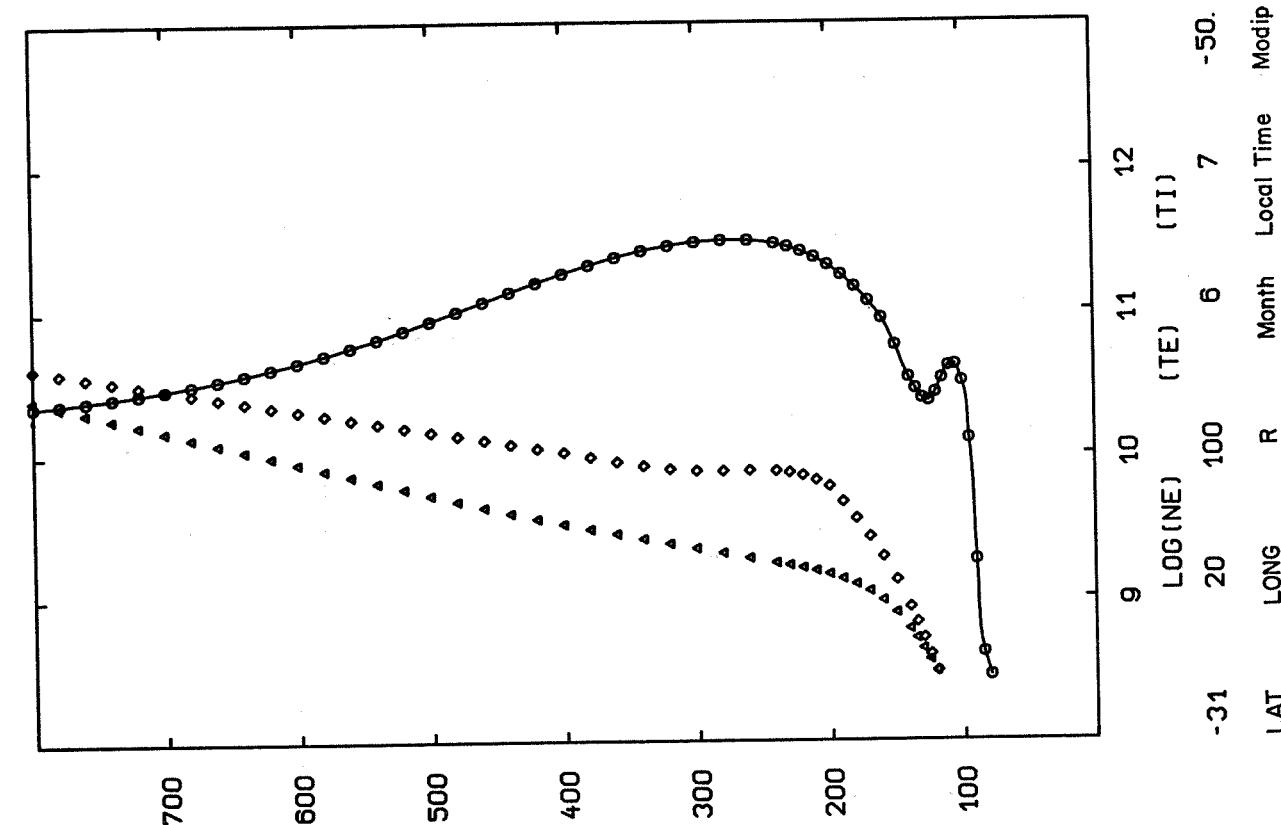




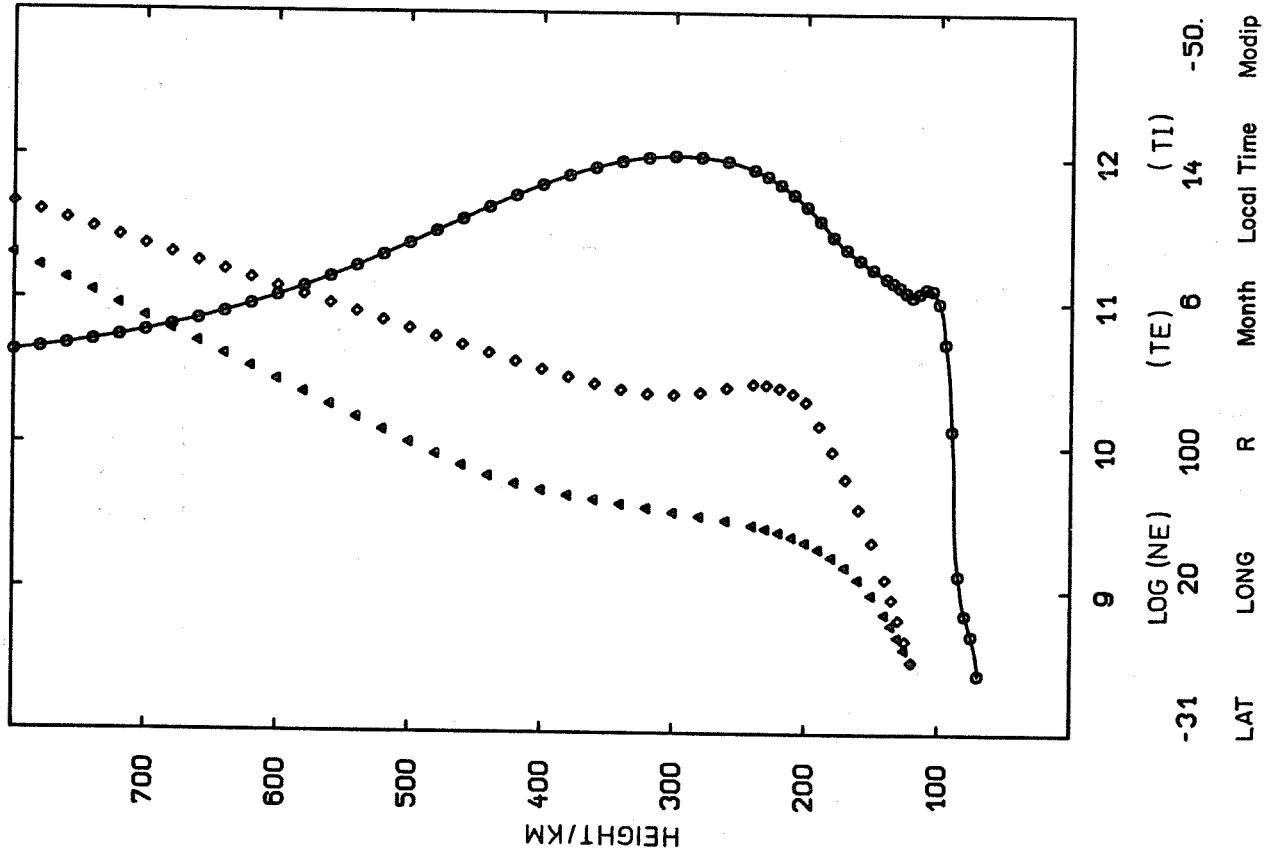
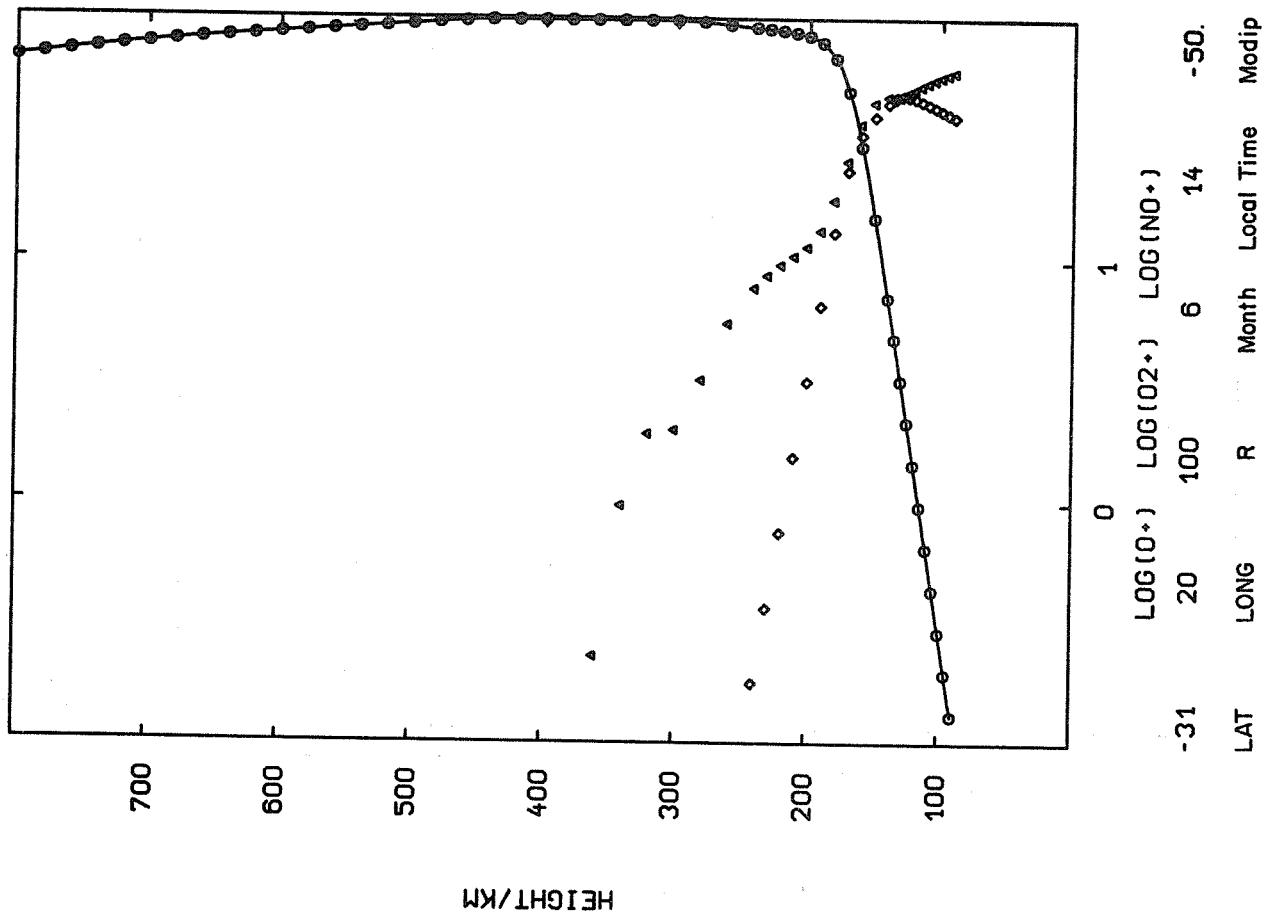


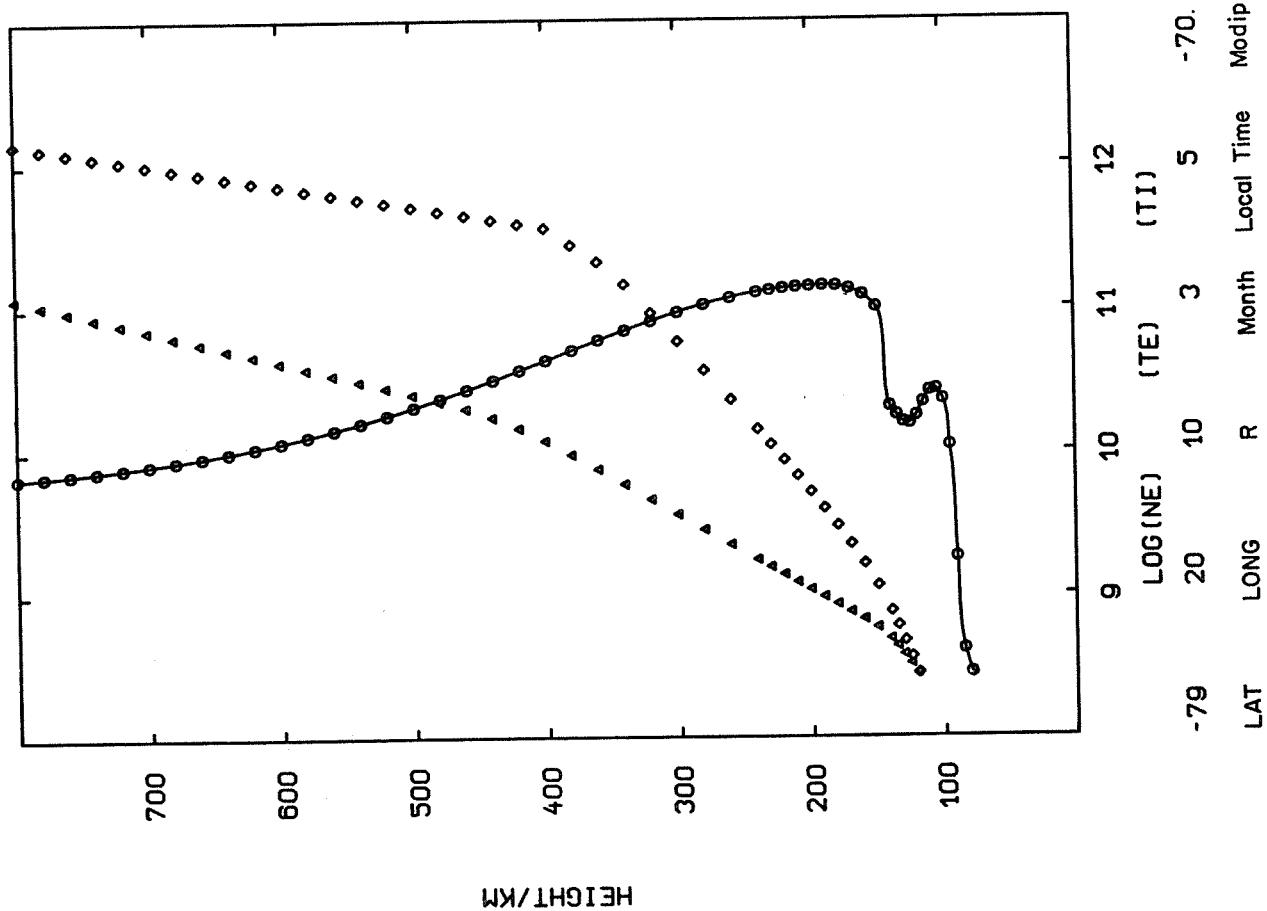
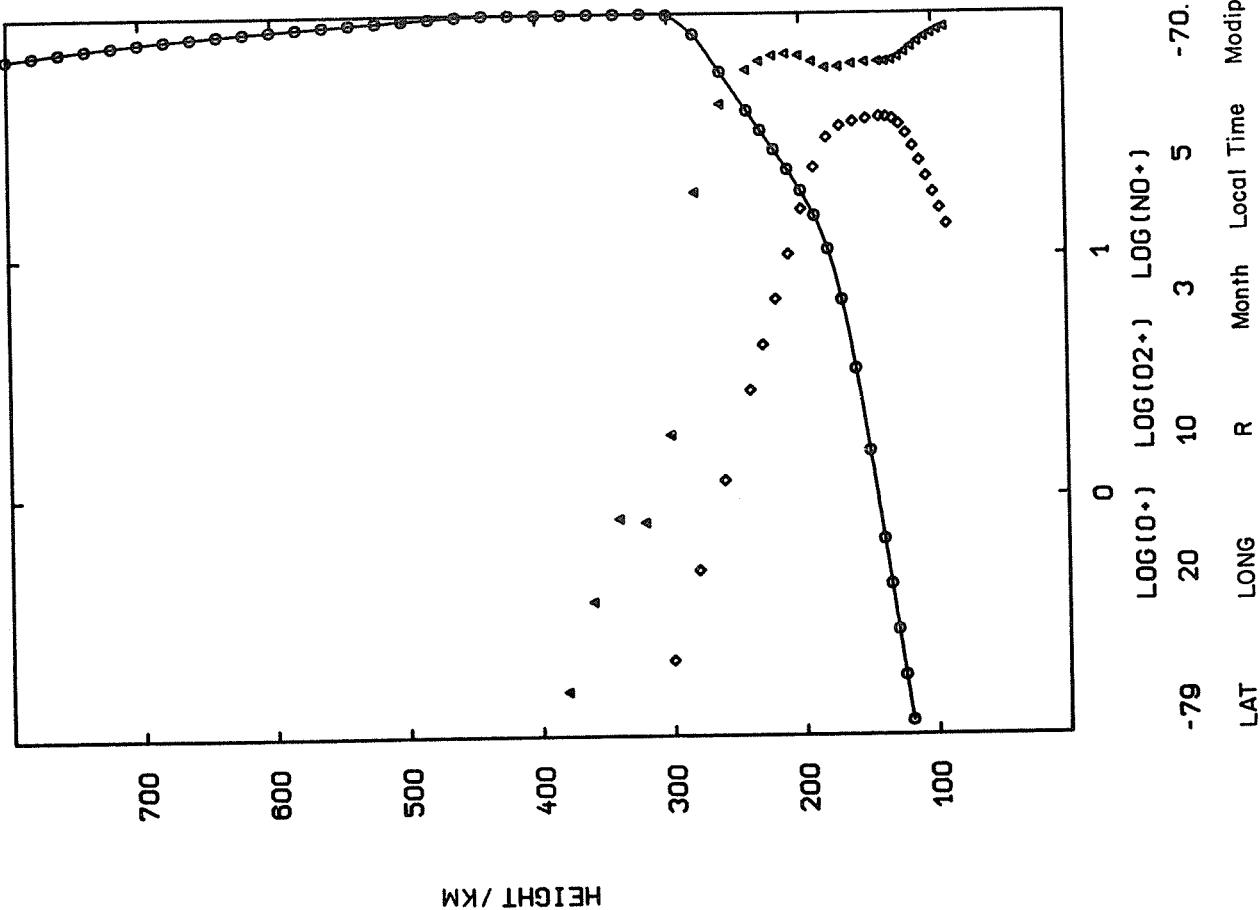


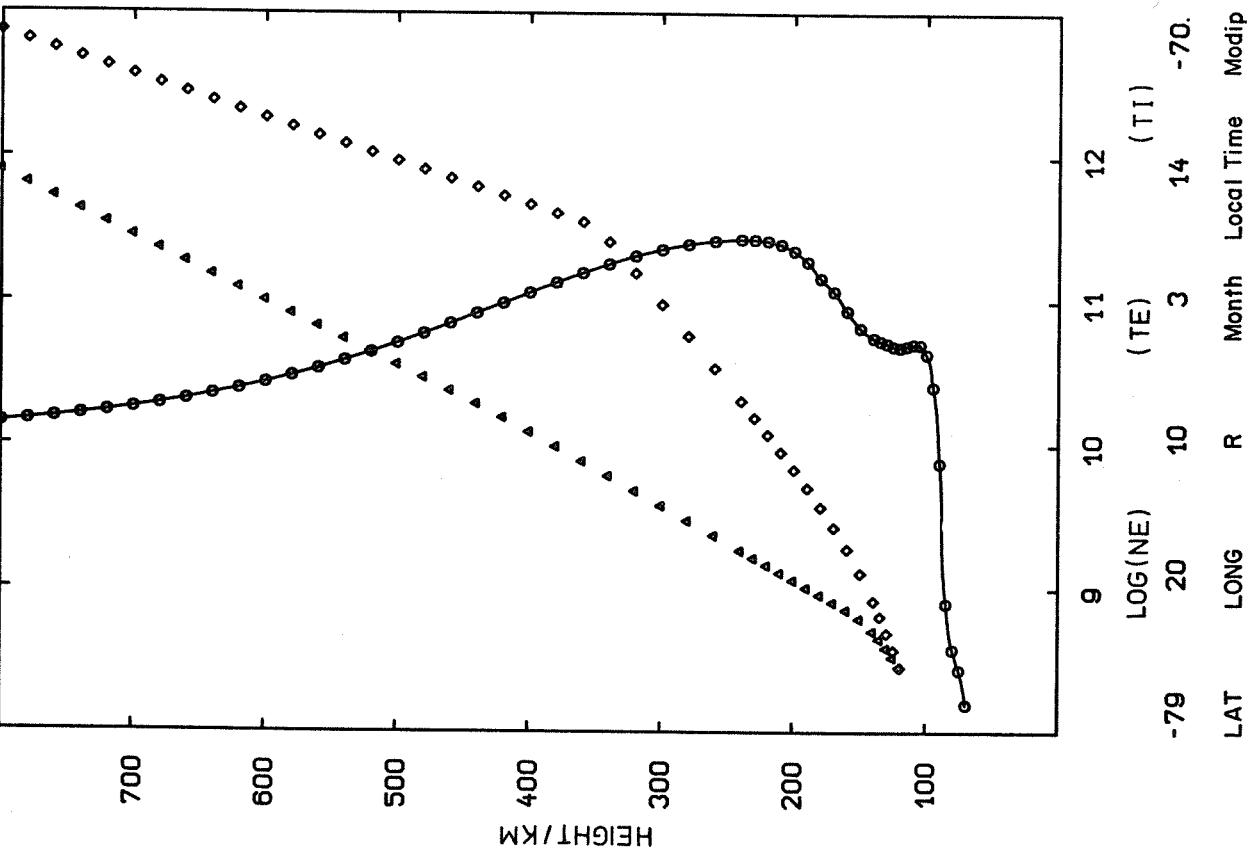
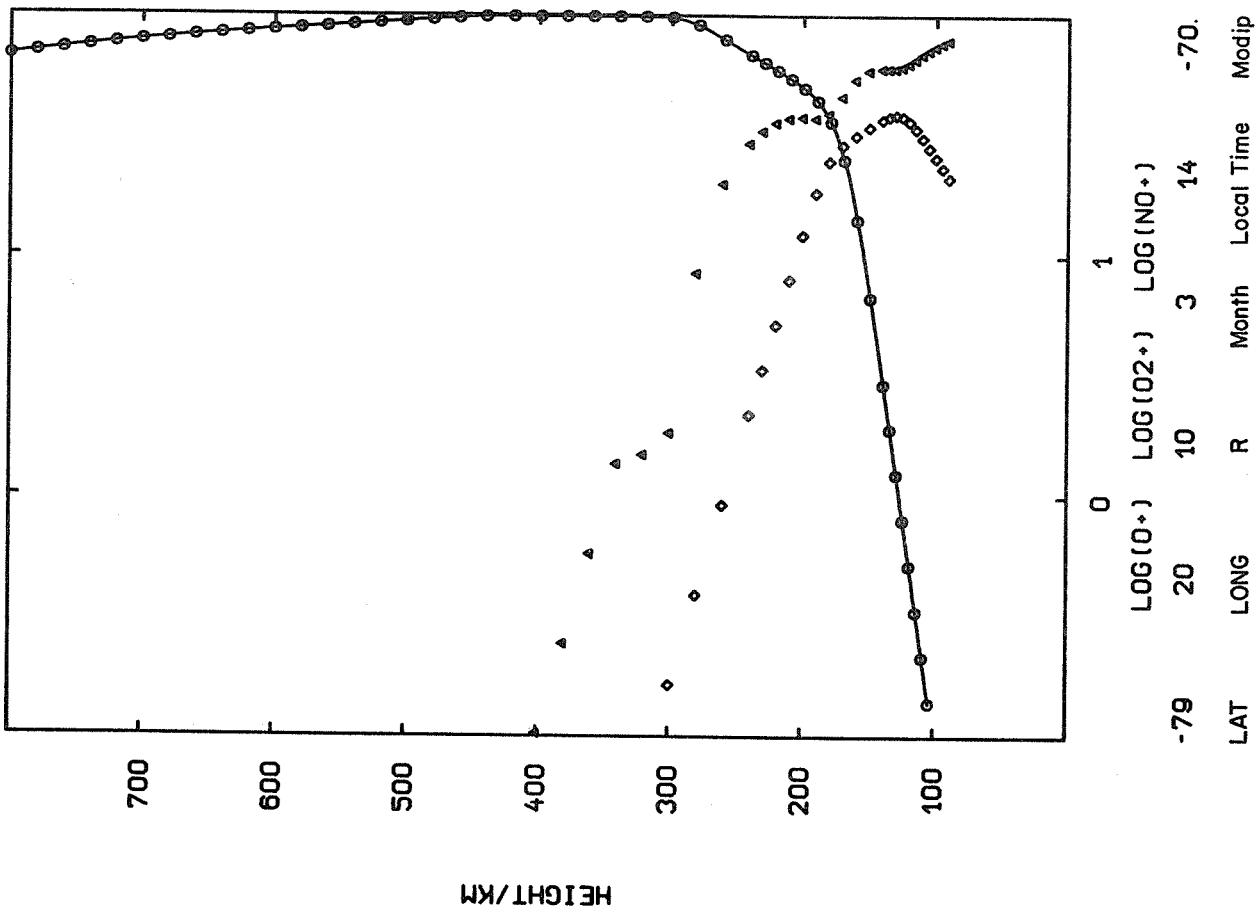
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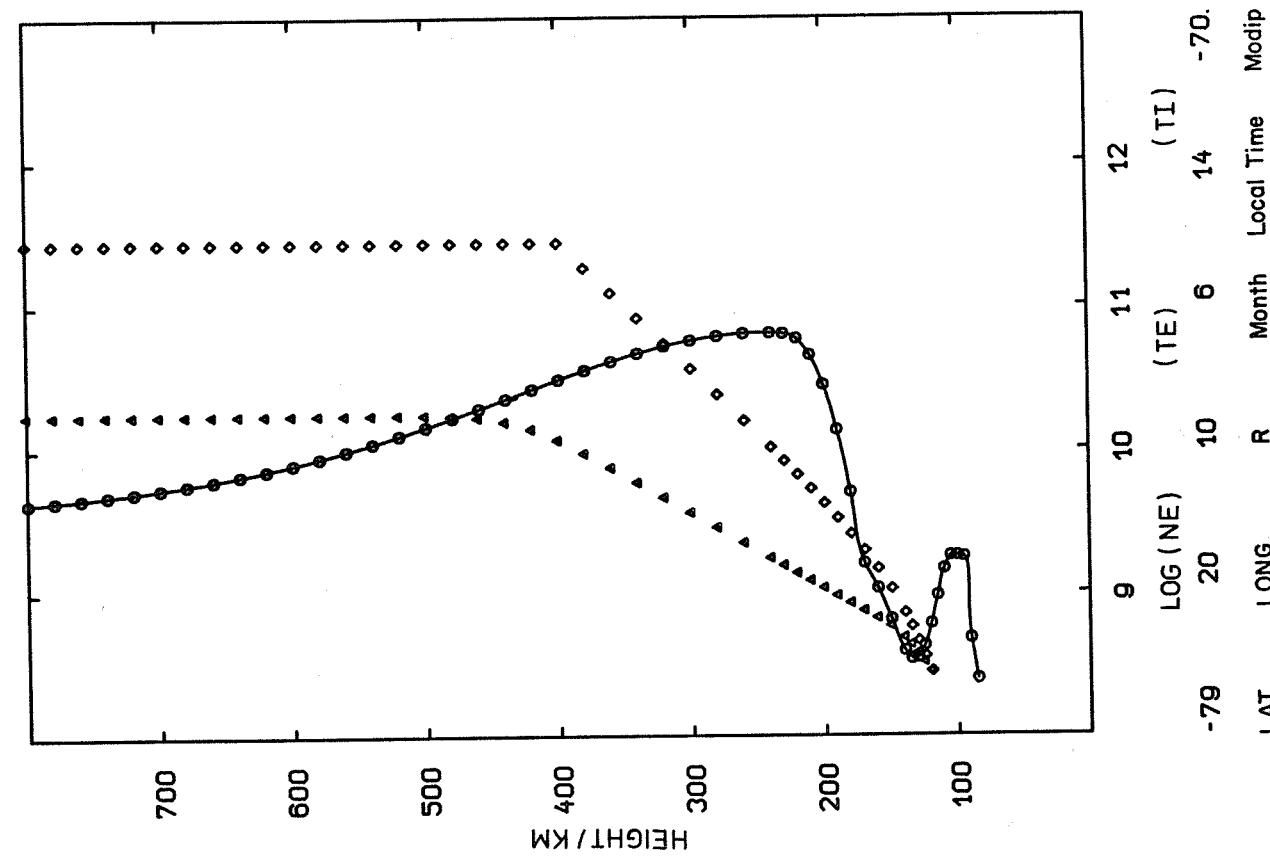
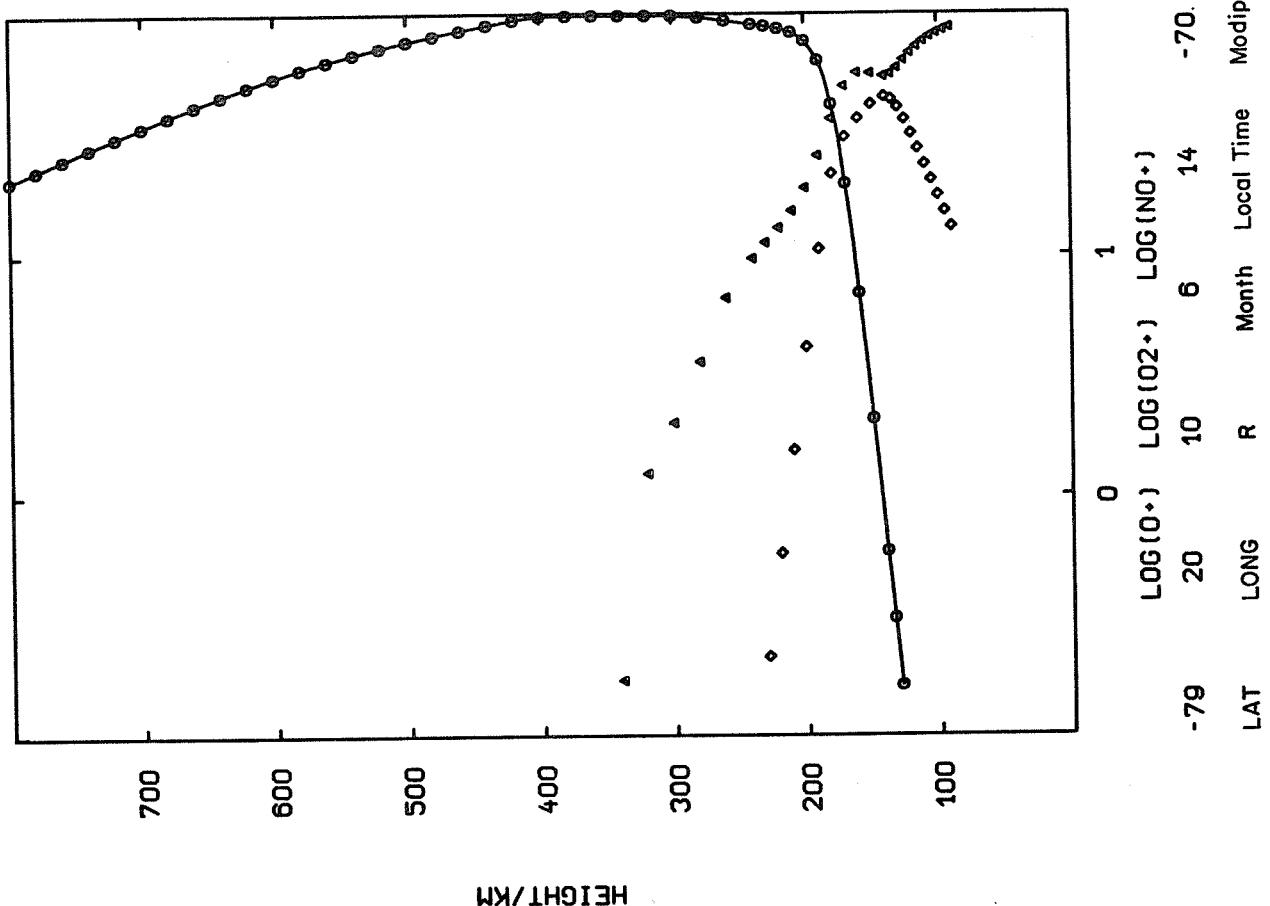


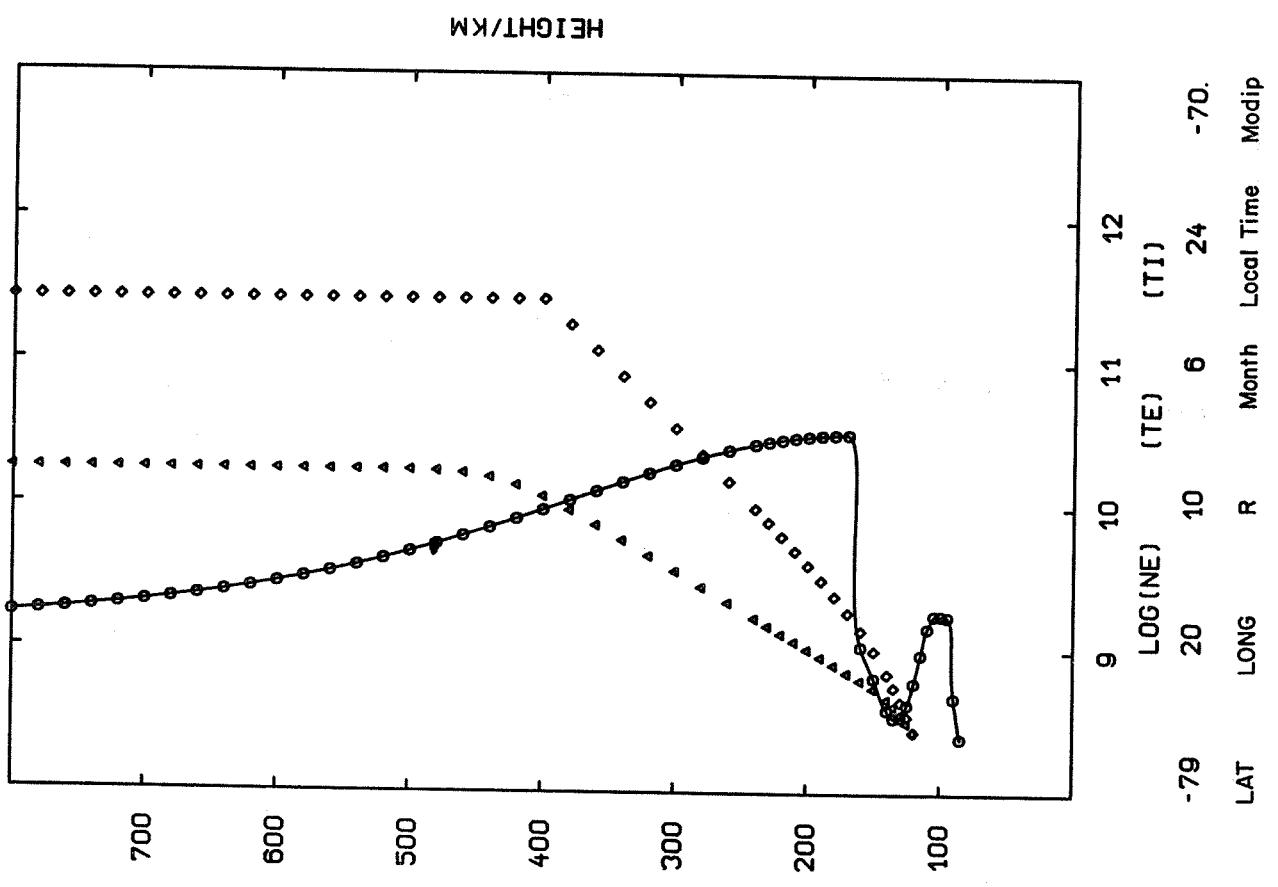
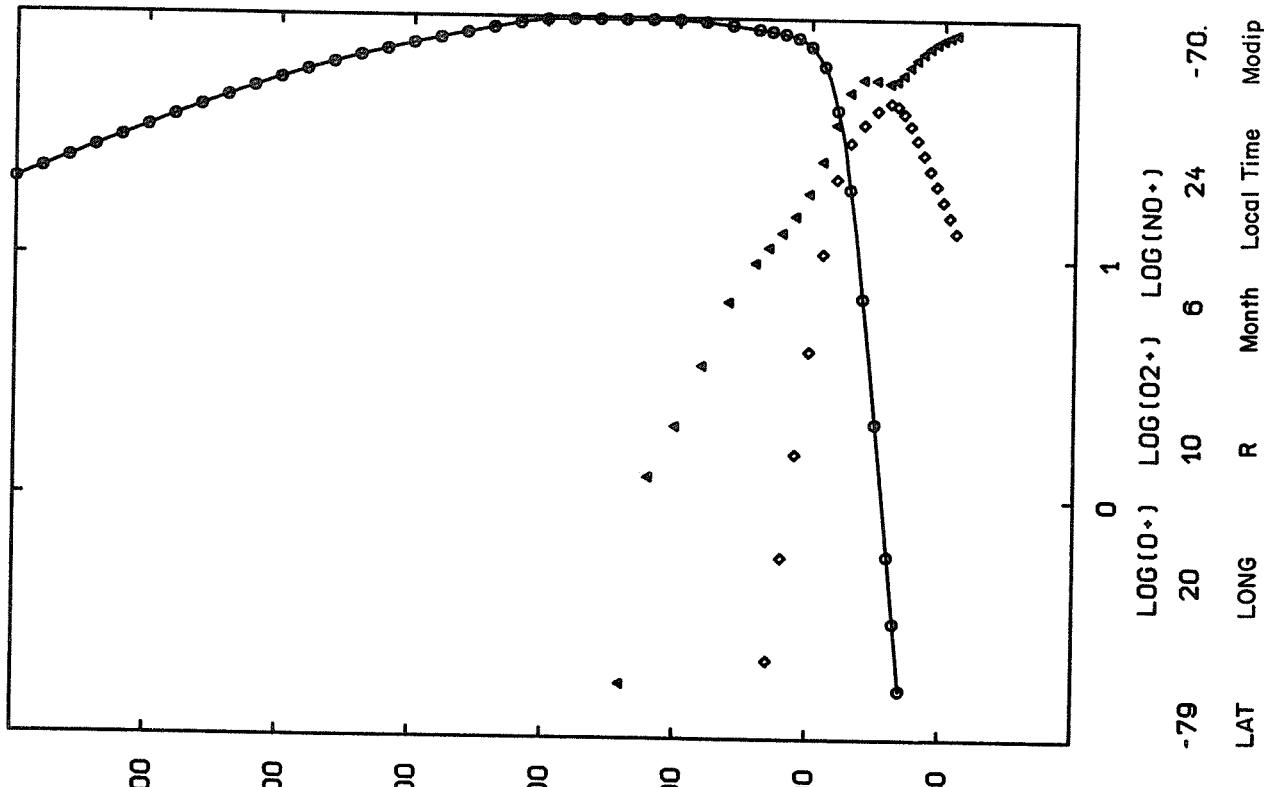
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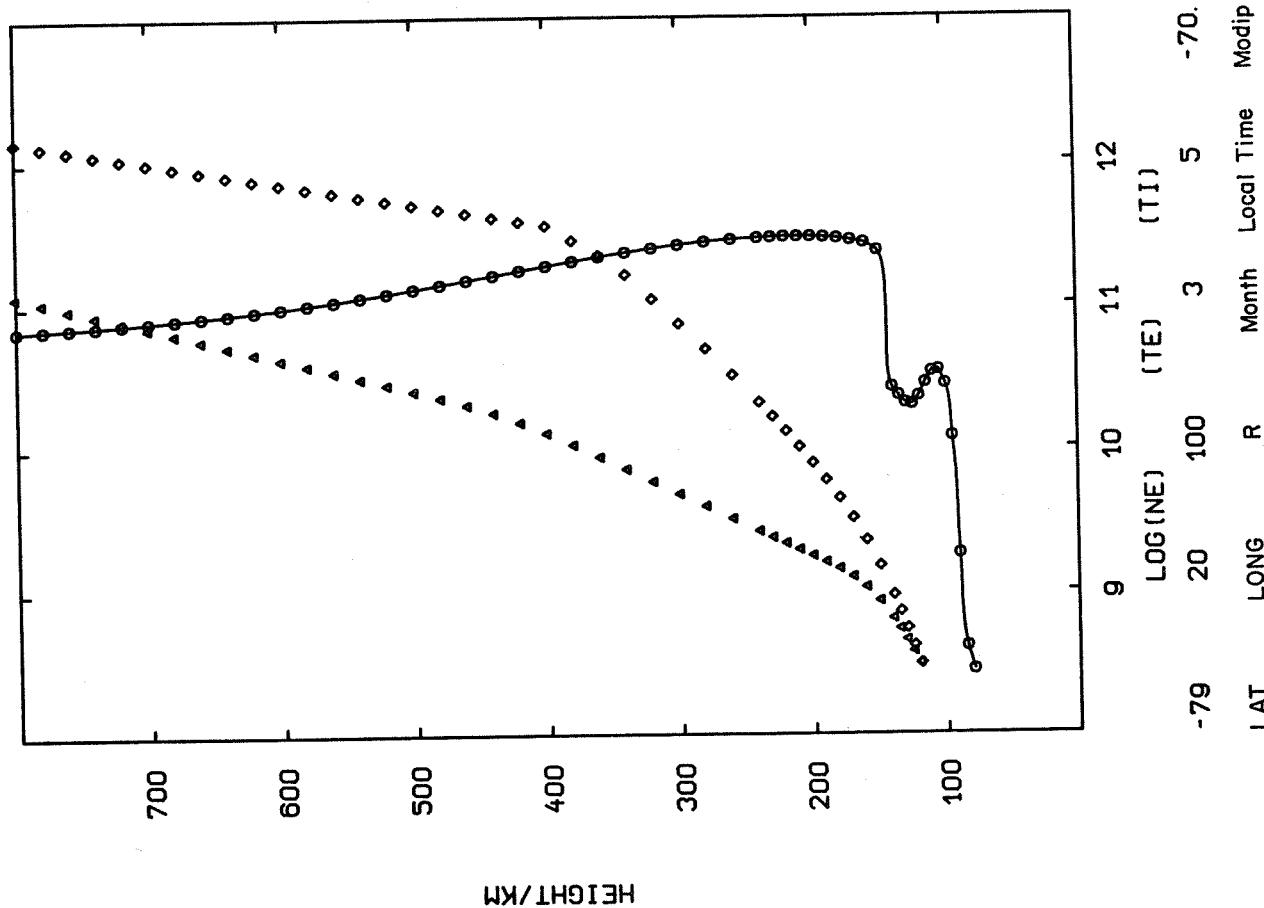
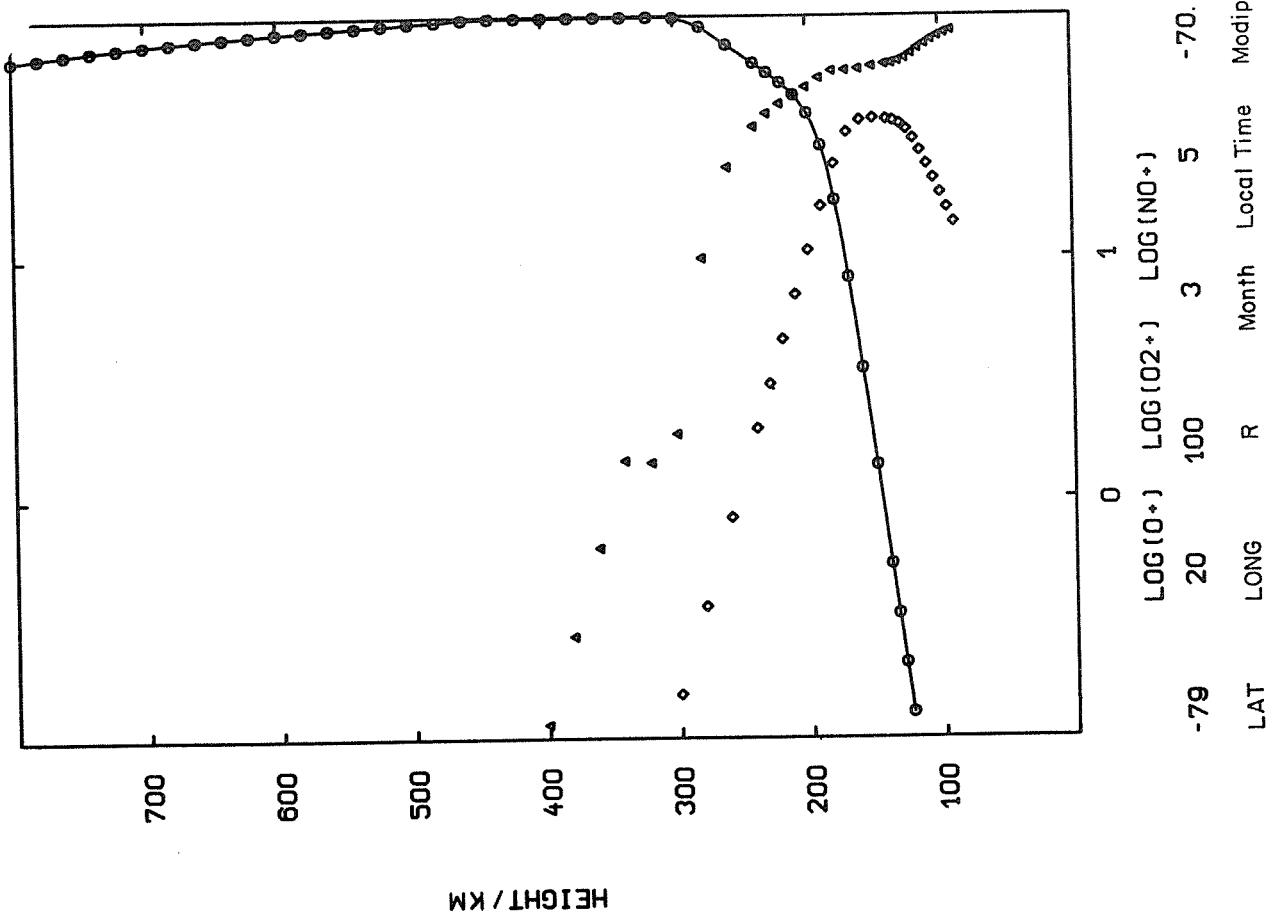


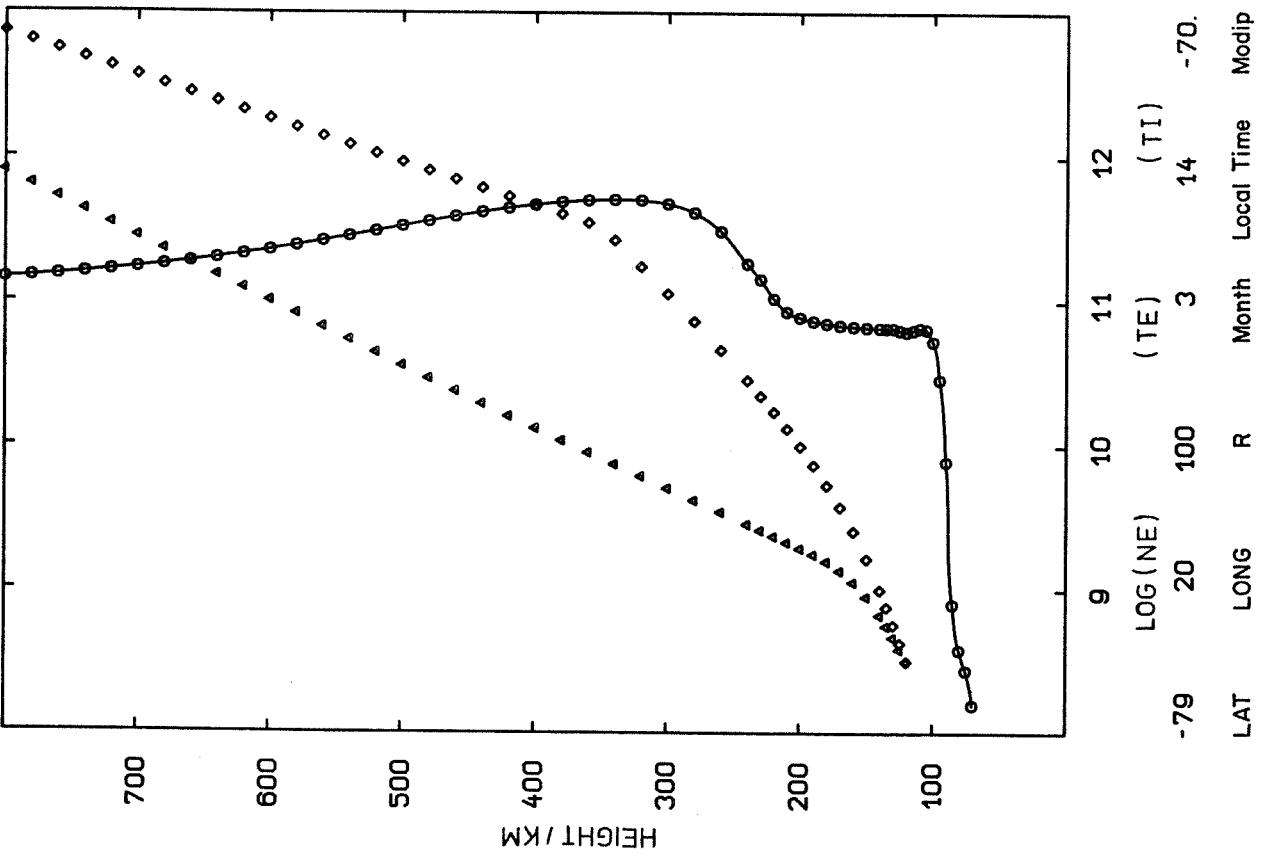
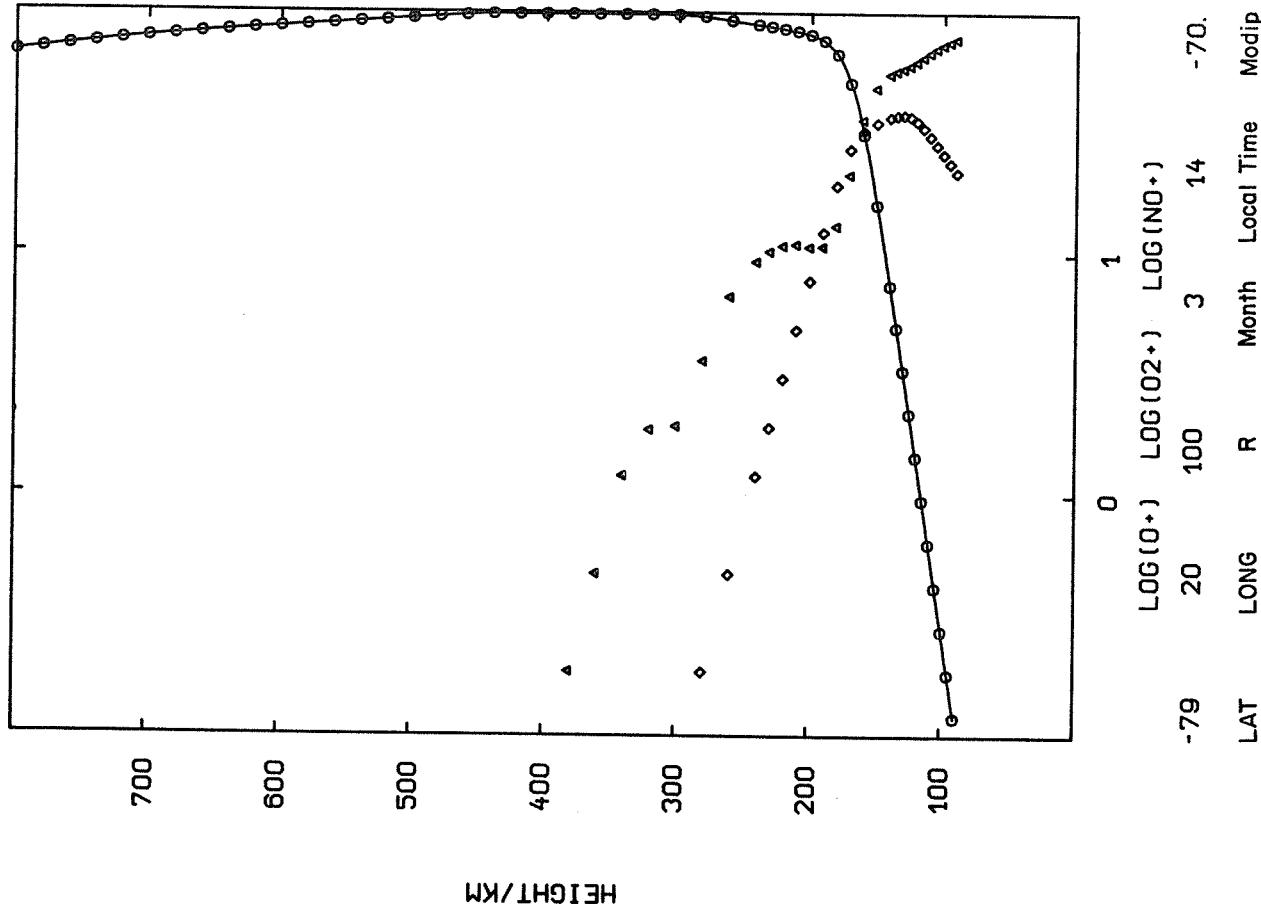


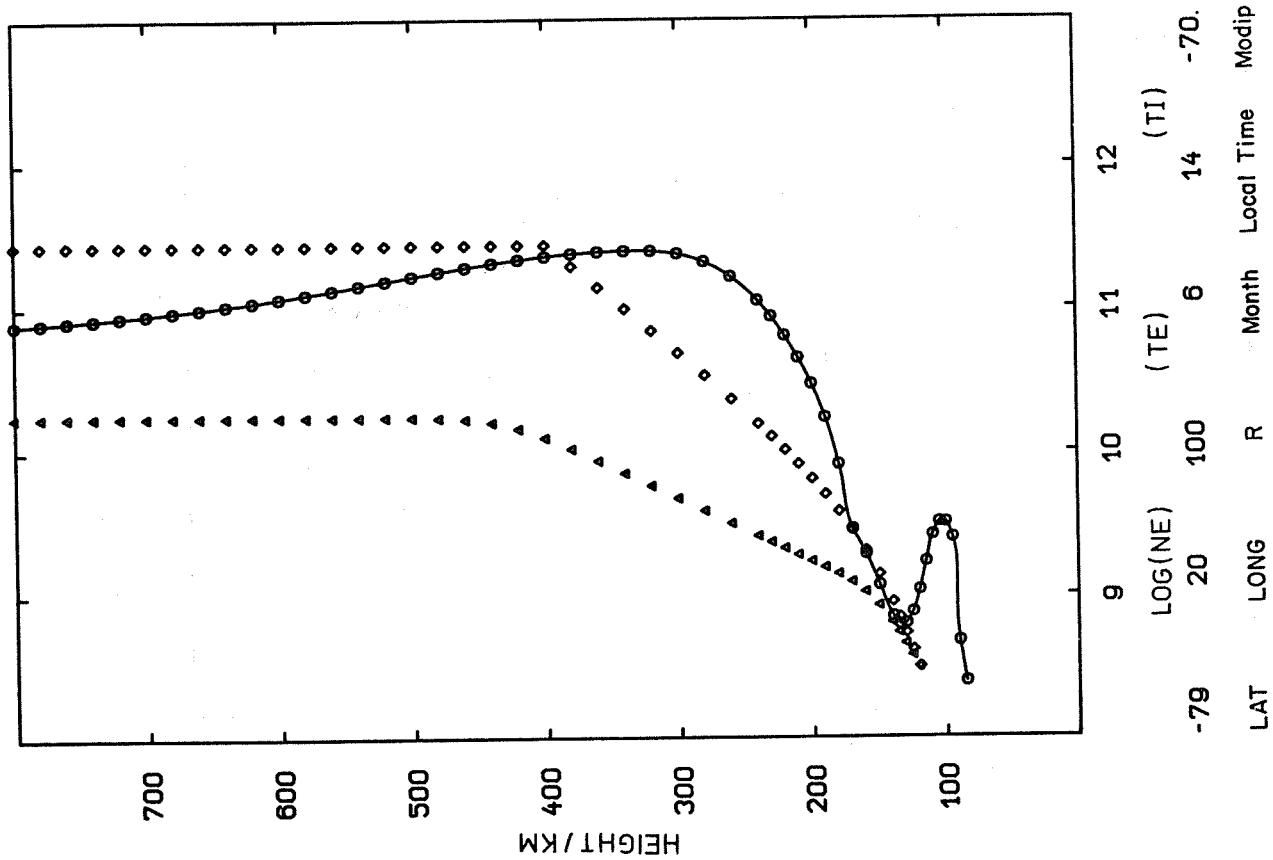
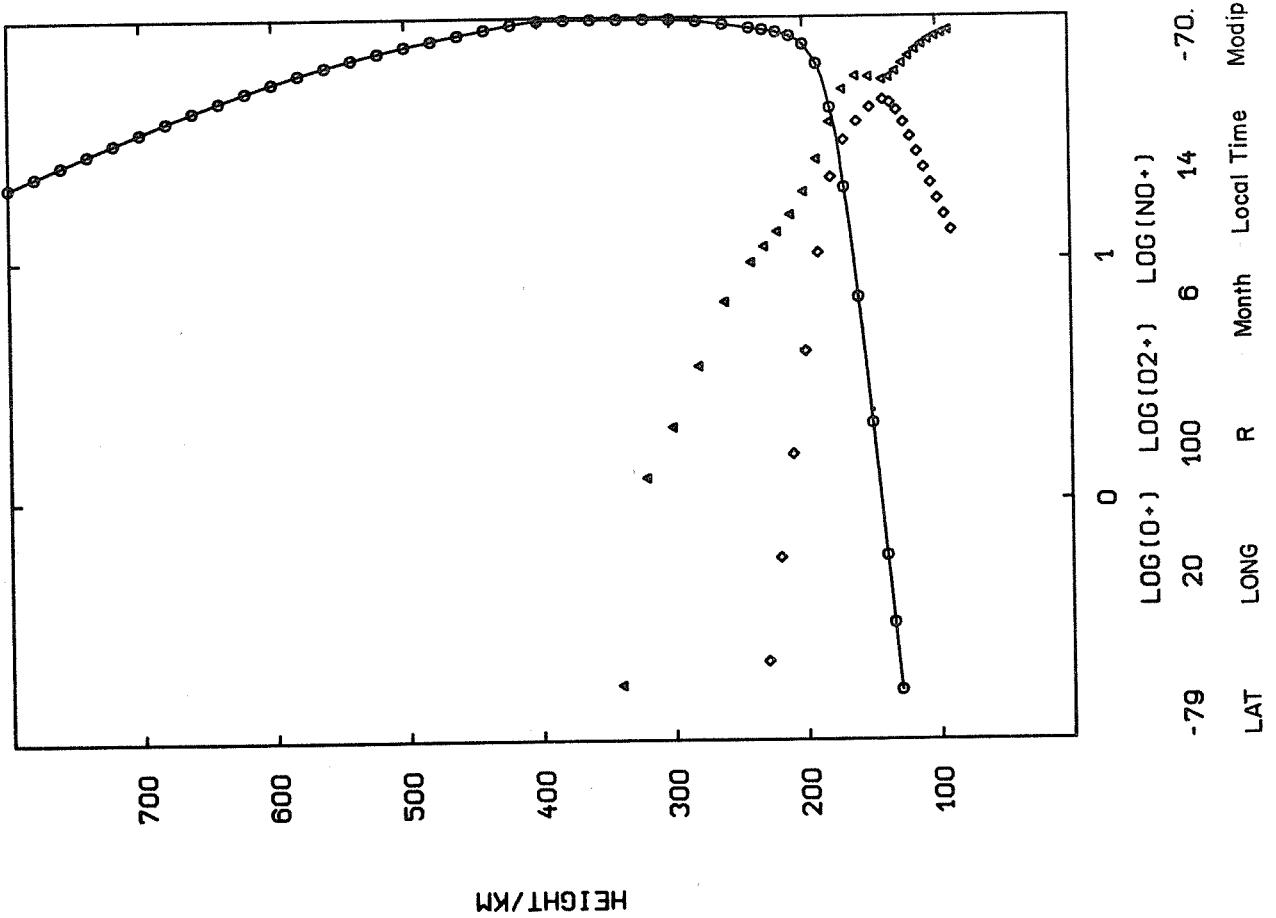


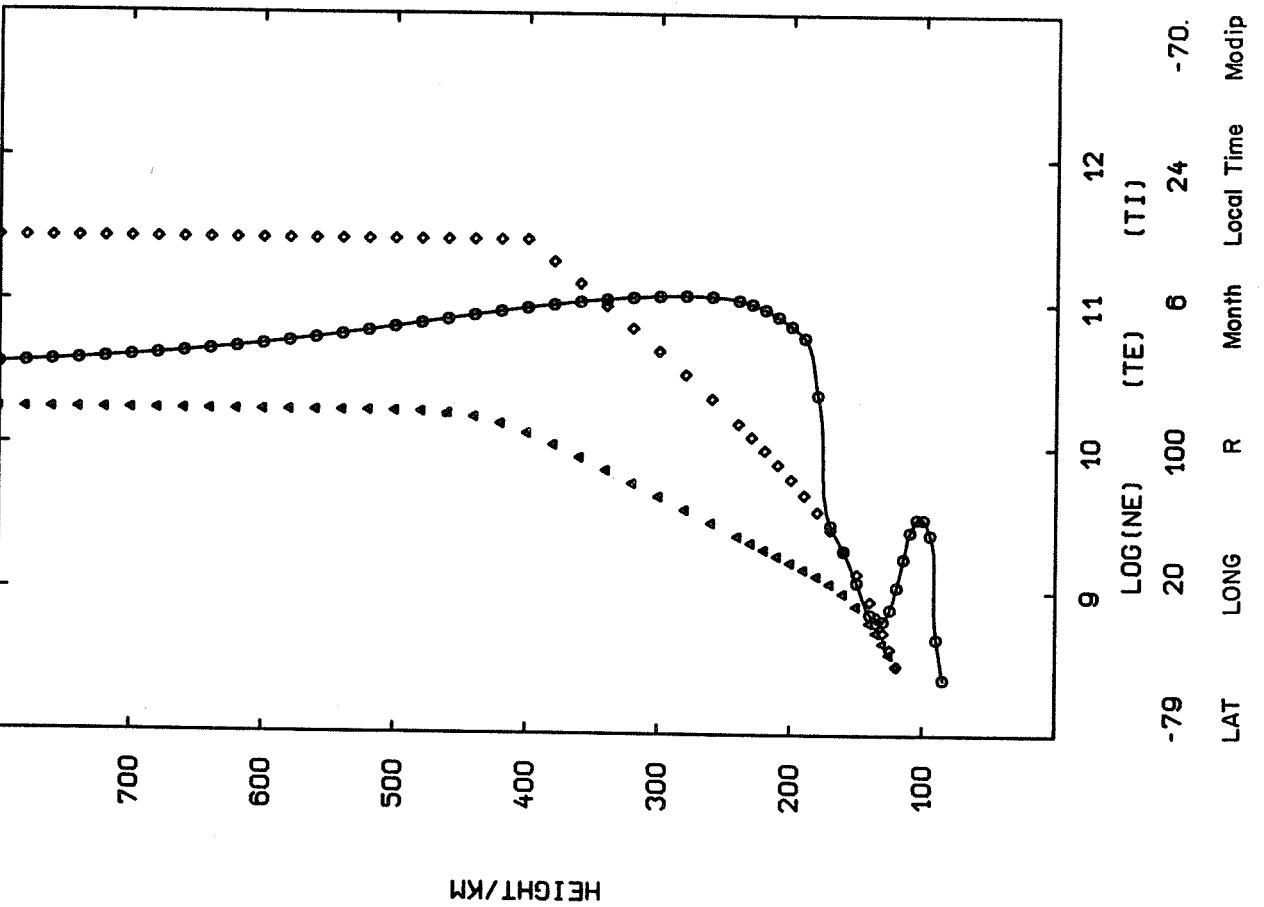
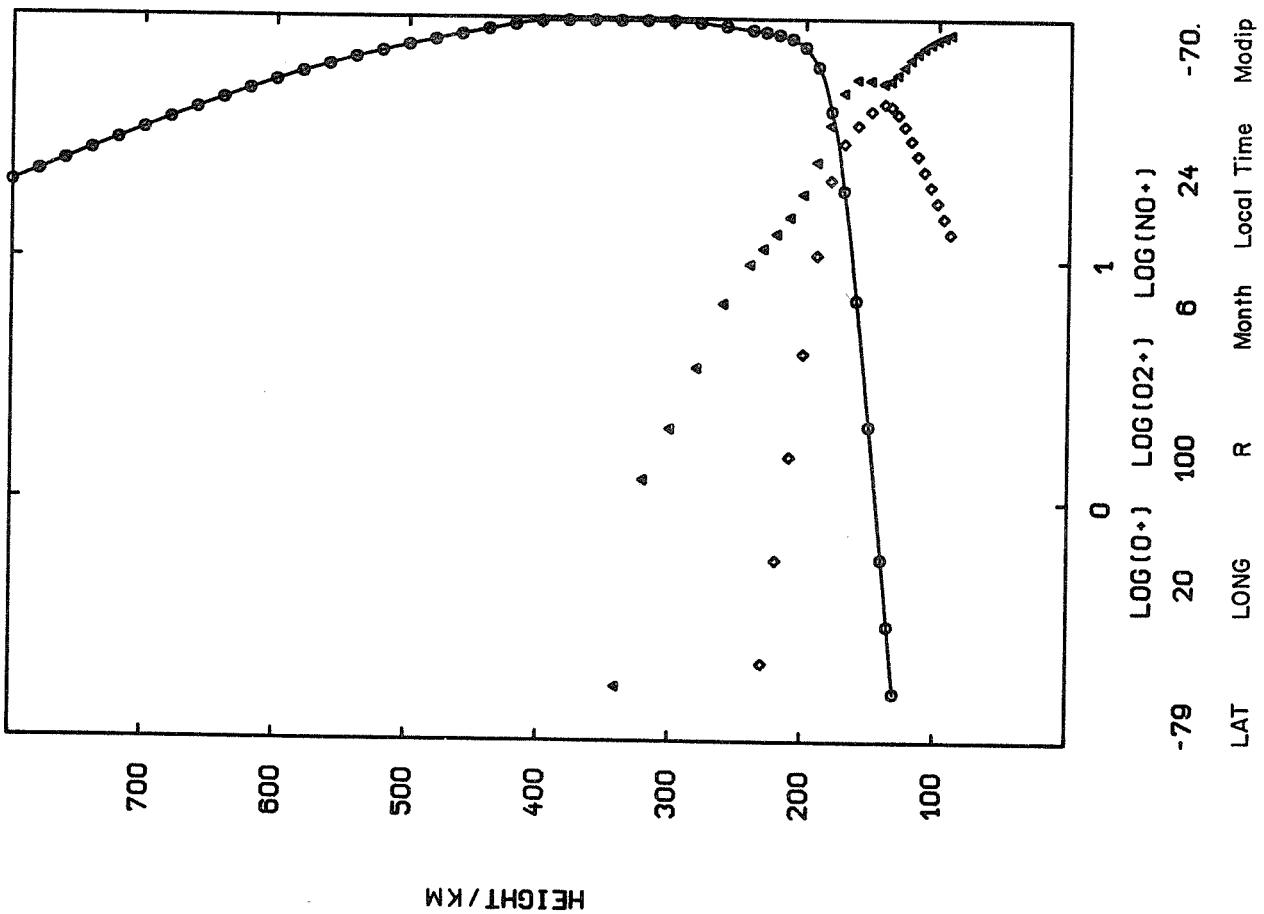












5. FORTRAN PROGRAM

The FORTRAN program is reproduced in this section. The ALGOL programs as submitted by Dr. Rawer are available upon request to the World Data Center A for Solar-Terrestrial Physics. They have not been adapted to the WDC-A for STP computers.

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1. C      IRIF07-A, DECEMBER 1980
2. C      INTERNATIONAL REFERENCE IONOSPHERE (IRI).
3. C      THIS PROGRAM PRODUCES HEIGHT PROFILES OF TEMPERATURE
4. C      AND DENSITY OF THE ELECTRONS AND IONS IN THE IONOSPHERE FOR
5. C      SPECIFIED LOCATION, TIME AND SOLAR ACTIVITY.
6. C      ADDRESS@ PROF.K.RAWER, HERRENSTR.43
7. C      D 7801 MARCH , F.R.G.
8. C      INPUT:
9. C      1.) LATITUDE(F6.1),LONGITUDE(F6.1),SOLAR-ACTIVITY(R)(F6.1),
10. C      MONTH(F4.1),HOUR(F4.1,1X),XHI(F6.1),BEGIN,END,STEPWIDTH(OF THE
11. C      REQUIRED HEIGHT RANGE)(3(F6.1,1X)),KOBE(I1,1X),JNE,JNEMAX,
12. C      JTN,JTE,HTI,HTETI,JO,JHHE,J02,JNO,JMAG(11I1)
13. C      2.) HMF2/KM AND NMF2/M-3 OR FOF2/MHZ (F5.1,E9.3)
14. C      IF HMF2 LESS 10.0 THEN THE CCIR VALUES FOR FOF2 AND HMF2
15. C      ARE TAKEN BY USE OF THE CCIR-TAPE FOR FOF2 AND M3000.
16. C      THE USER SHOULD ADAPT PROCEDURE CCIRCA TO HIS OWN
17. C      CCIR-TAPE.
18. C      KOBE=0 SHOULD BE USED FOR PRINTER OUTPUT AND KOBE=1 FOR
19. C      PUNCHER OR TAPE OUTPUT. THE TEN INPUT VARIABLES
20. C      (JNE...JNO) ARE SWITCHED (1=YES,0=NO) TO CHOOSE YOUR
21. C      PARAMETERS. JMAG=0 MEANS GEOGRAPHIC JMAG=1 GEOMAGNETIC
22. C      LATITUDE AND LONGITUDE.
23. C
24. C-WDC-A  THIS PROGRAM HAS BEEN MODIFIED AT WDC-A TO BE MORE MACHINE
25. C-WDC-A  INDEPENDENT.
26. C-WDC-A  NOTE 1) INITIALIZATION OF VARIABLES IS NOT NECESSARY.
27. C-WDC-A  NOTE 2) THIS VERSION OF THE PROGRAM DOES NOT ALLOW YOU
28. C-WDC-A  TO CHOOSE WHICH PARAMETERS ARE OUTPUT. A FIXED OUTPUT
29. C-WDC-A  WAS USED TO ASSURE EXECUTION ON ANY MACHINE.
30. C-WDC-A  NOTE 3) YOU WILL HAVE TO OPEN YOUR CHANNEL NUMBERS, ON A
31. C-WDC-A  CONTROL DATA MACHINE THIS WOULD BE A PROGRAM CARD, ON
32. C-WDC-A  A DATA GENERAL THIS WOULD BE AN OPEN CARD, ETC. THE
33. C-WDC-A  CHANNEL VARIABLES SPECIFIED BY THE VARIABLES EGNR,AGNR
34. C-WDC-A  AND KONSOL CAN BE CHANGED TO ANY VALUE YOU LIKE,
35. C-WDC-A  SO LONG AS YOU REPLACE THOSE CHANGES IN YOUR CHANNEL
36. C-WDC-A  OPENING STATEMENT.
37. C-WDC-A  IN THIS VERSION:
38. C-WDC-A    EGNR = INTERACTIVE INPUT OF DATA AND OPTIONS
39. C-WDC-A    AGNR = OUTPUT- PRINTOUT OR DISK FILE
40. C-WDC-A    KONSOL = INTERACTIVE OUTPUT OF INFORMATIVE STATEMENTS
41. C-WDC-A    UNIT 15 = CCIR COEFFICIENTS
42. C-WDC-A  NOTE 4) THIS VERSION OF IRIF07 IS INTENDED TO USE THE CCIR
43. C-WDC-A  COEFFICIENTS PROVIDED WITH THIS PROGRAM TAPE. THE READ
44. C-WDC-A  STATEMENTS IN CCIRCA MUST BE CHANGED IF YOU ARE USING
45. C-WDC-A  A DIFFERENT SET OF COEFFICIENTS.
46. C
47. C-WDC-A  OPEN CHANNELS FOR UNIVAC 1100 (WDC-A).
48. C
49.     DEFINE FILE 11(AREAD,,80)
50.     DEFINE FILE 12(APRINT,,80)
51.     DEFINE FILE 14(SDF,,80,80)
52.     DEFINE FILE 15(SDF,,80)
53.     INTEGER EGNR,AGNR,SMONTH,SHOUR,DAYNR,DDO(4)
54.     1,IIF(4),DO2(2)
55.     REAL LATI,LONGI,M02(3),MO(5),LOGE,MONTH,MODIP,NMF2,
56.     2NDELO,NMF1,NME,NMD,K,MAGBR,
57.     1NHABR,NDEL,NDX,NEI,MM,MLAT,MLONG,NOBO2
58.     DIMENSION F(3),BOF(2,2,8),OUTF(50,12),JF(10),RIF(4),
59.     1PF10(12),PF30(12),HO(4),
60.     2PF20(4),HO2(2),CTNN(3),PG10(80),PG20(32),PG30(80)
61.     LOGICAL WINTER,SUMMER,SCHALT,EXT,NIGHT,F1REG,VALLEY,
62.     1IRDUPP,CCIREI,ANF,TEMP,TEVAL,TIMP
63.     COMMON/BLOCK1/HMF2,NMF2,HMF1/BLOCK2/B0,B1,C1,HZ,T,G(144),HST,STR
64.     4/BLOCK3/HDX,HME,
65.     1NME,HMD,NMD,HEF,D1,K,FP30,FP3U,FP1,FP2/BLOCK4/HB,HC,P9,P10,
66.     2P11,P12,IRDL,OW,AGNR,IRDUPP,P(8)/BLOCK5/ZX,TNX,ATN,CTN(3)/
67.     3BLOCK8/HS,TNHS,XSM(2),MM(3)/BL010/BETA,ETA,DELTA,ZETA/
68.     XBL011/MONTH,LATI/BLOCK6/NIGHT,E(4)

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69.      EXTERNAL SSRSU,XE1,XE2,XE3,XE4,XE5,XE6,TEDER
70.      C
71.      C-WDC-A THIS DATA STATEMENT IS NECESSARY IF ALL PARAMETERS ARE TO BE
72.      C-WDC-A OUTPUT. THE OPTION OF VARIOUS TYPES OF OUTPUT IS NOT
73.      C-WDC-A ACTIVE IN THIS VERSION, THUS ALL OUTPUT TYPES ARE SUPPLIED
74.      C-WDC-A BY MAKING ALL ELEMENTS OF THE ARRAY JF EQUAL 1.
75.      C
76.      DATA JF /10*1/
77.      ALH=10.0
78.      LOGE=1 ALOG(ALH)
79.      UMR=0.01745329
80.      PHI=3.1415927
81.      CCIREI=.FALSE.
82.      C      'COMMENT' FIRST SPECIFY YOUR COMPUTERS CHANNEL NUMBERS, E.G.
83.      EGNR=11
84.      AGNR=14
85.      KONSOL=12
86.      C
87.      C-WDC-A IF YOU WISH TO READ MORE THAN ONE HOUR AT A TIME ADD AN
88.      C-WDC-A END OF FILE TEST BELOW. IF EOF TRUE THEN GO TO STATEMENT 999
89.      C
90.      2000 WRITE(KONSOL,2020)
91.      READ(EGNR,2005) LATI
92.      WRITE(KONSOL,2021)
93.      READ(EGNR,2005) LONGI
94.      WRITE(KONSOL,2022)
95.      READ(EGNR,2005) R
96.      WRITE(KONSOL,2023)
97.      READ(EGNR,2003) MONTH
98.      WRITE(KONSOL,2024)
99.      READ(EGNR,2003) HOUR
100.     WRITE(KONSOL,2025)
101.     READ(EGNR,2005) XHI
102.     WRITE(KONSOL,2026)
103.     READ(EGNR,2005) AH
104.     WRITE(KONSOL,2027)
105.     READ(EGNR,2005) EH
106.     WRITE(KONSOL,2028)
107.     READ(EGNR,2005) SH
108.     WRITE(KONSOL,2029)
109.     READ(EGNR,2009) KOBE
110.     WRITE(KONSOL,2030)
111.     READ(EGNR,2009) JMAG
112.     WRITE(KONSOL,2031)
113.     READ(EGNR,2011) HMF2
114.     WRITE(KONSOL,2032)
115.     READ(EGNR,2012) FOF2
116.     2003 FORMAT(F4.1)
117.     2005 FORMAT(F6.1)
118.     2009 FORMAT(I1)
119.     2011 FORMAT(F5.1)
120.     2012 FORMAT(E9.3)
121.     2020 FORMAT('/', INPUT PARAMETERS.....',
122.           X '/,' LATITUDE ?')
123.     2021 FORMAT('/', LONGITUDE ?')
124.     2022 FORMAT('/', SUNSPOT ?')
125.     2023 FORMAT('/', MONTH ?')
126.     2024 FORMAT('/', HOUR ?')
127.     2025 FORMAT('/', SOLAR ZENITH ANGLE ',
128.           X '(-10.0 TO HAVE PROGRAM CALCULATE IT) ?')
129.     2026 FORMAT('/', LOWER LIMIT ?')
130.     2027 FORMAT('/', UPPER LIMIT ?')
131.     2028 FORMAT('/', STEP WIDTH ?')
132.     2029 FORMAT('/', TYPE OF OUTPUT (0=PRINT,1=FILE) ?')
133.     2030 FORMAT('/', GEOMAGNETIC COORDINATES (0=NO,1=YES) ?')
134.     2031 FORMAT('/', HMF2 (0 TO HAVE PROGRAM CALCULATE IT) ?')
135.     2032 FORMAT('/', FOF2 (0 TO HAVE PROGRAM CALCULATE IT) ?')
136.           IOND=JF(8)+JF(9)+JF(10)+JF(7)
137.     C
138.     C      INPUT OF TRANSFORMATION COEFFICIENTS (PROCEDURE FIELDG) .....
139.     C
140.     CALL KOEFFI(BOF)
141.     CALL KOEFFB(G)
142.     C
143.     C      CALCULATION OF XHT,SUNSET,SUNRISE,COV,XHIM .....
144.     C

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145.      IF(JMAG.LE.0) GOTO 888
146.      MLAT=LATI
147.      MLONG=LONGI
148. 888     CALL GGM(JMAG,LONGI,LATI,MLONG,MLAT)
149.      DAYNR=IFIX(MONTH)*30-15
150.      SUNDEC=-0.40915*COS(2.0*PHI/365.25*FLOAT(DAYNR+8))
151.      Z1=SIN(SUNDEC)*SIN(LATI*UMR)
152.      Z2=COS(SUNDEC)*COS(LATI*UMR)
153.      IF(ABS(Z2).GT.0.0) GOTO 120
154.      SAX=24.0
155.      IF(Z1.GE.0.0) SAX=0.0
156.      GOTO 140
157. 120     IF(ABS(Z1/Z2).LE.1.0) GOTO 510
158.      SAX=24.0
159.      IF((Z1+Z2).GE.0.0) SAX=0.0
160.      GOTO 140
161. 510     SAX=12.0-ACOS(-Z1/Z2)/(UMR*15.0)
162. 140     SUX=24.0-SAX
163.      XLSTA=15.0*(HOUR-12.0)
164.      COV=63.75+R*(0.728+R*0.00089)
165.      IF(XHI.GT.(-10.0)) GOTO 520
166.      COSXHI=SIN(LATI*UMR)*SIN(SUNDEC)+COS(LATI*UMR)*COS(SUNDEC)
167.      1*COS(XLSTA*UMR)
168.      XHI=ACOS(COSXHI)/UMR
169.      GOTO 503
170. 520     COSXHI=COS(XHI*UMR)
171. 503     XHIO=0.87+0.0061*ABS(LATI)
172.      XHI100=0.68+0.0089*ABS(LATI)
173.      XHIM=(XHIO+(XHI100-XHIO)*R/100.0)/UMR
174.      CALL FIELDG(LATI,LONGI,300.0,XMA,YMA,ZMA,BET,DIP,MODIP)
175.      MAGBR=ATAN(0.5*TAN(DIP*UMR))/UMR
176.      SUNDEC=SUNDEC/UMR
177. C      CLASSIFICATION OF DIFFERENT TIMES AND REGIONS .....
178. C
179. C
180.      F1REG=.TRUE.
181.      VALLEY=.FALSE.
182.      SUMMER=.FALSE.
183.      WINTER=.FALSE.
184.      NIGHT=.FALSE.
185.      TEMP=.TRUE.
186.      TIMP=.TRUE.
187.      TEVAL=.FALSE.
188.      IF((MONTH.GT.10.0).OR.(MONTH.LT.3.0)) WINTER=.TRUE.
189.      IF((MONTH.GT.4.0).AND.(MONTH.LT.9.0)) SUMMER=.TRUE.
190.      EXT=SUMMER
191.      IF(LATI.GT.0.0) GOTO 1111
192.      EXT=WINTER
193.      WINTER=SUMMER
194. 1111    SUMMER=EXT
195.      IF((HOUR.GT.SUX).OR.(HOUR.LT.SAX)) NIGHT=.TRUE.
196.      IF(XHI.GT.XHIM) F1REG=.FALSE.
197.      IF(NIGHT) F1REG=.FALSE.
198.      IF(WINTER) F1REG=.FALSE.
199. C      INPUT OF THE ION DENSITY PARAMETER ARRAYS PF10,PF20 AND PF30.....
200. C
201. C
202.      IF(IOND.LT.1) GOTO 141
203.      IIF(1)=2
204.      IF(ABS(LATI).LT.30.0) IIF(1)=1
205.      IIF(2)=2
206.      IF(COV.LT.100.0) IIF(2)=1
207.      IIF(3)=3
208.      IF(WINTER) IIF(3)=4
209.      IF(SUMMER) IIF(3)=2
210.      IIF(4)=1
211.      IF(NIGHT) IIF(4)=2
212.      CALL KOEFP1(PG10)
213.      CALL KOEFP2 (PG20)
214.      CALL KOEFP3 (PG30)
215.      DO 6000 I=1, 4
216.      RIF(I)=FLOAT(IIF(I))
217. 6000    CONTINUE
218.      CALL SUFE (PG10,RIF,12,PF10)
219.      CALL SUFE(PG20,RIF,4,PF20)
220.      CALL SUFE(PG30,RIF,12,PF30)

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221. C
222. C      CALCULATION OF ELECTRON DENSITY PARAMETERS..... .
223. C
224. 141 DELL=4.32
225. IF(ABS(MODIP).GE.18.0) DELL=1.0+EXP(-(ABS(MODIP)-30.0)/10.0)
226. IF(.NOT.F1REG) GOTO 150
227. C1=0.1244-(4.44E-4)*R+0.09/DELL
228. FOF1=FOF1ED(MAGBR,R,COSXHI)
229. NMF1=1.24E10*FOF1*FOF1
230. 150 XHINON=XHIS(MONTH,12.0,LATI)
231. FOE=FOEEDI(R,XHI,XHINON,LATI,HOUR,SUX,SAX)
232. IF(HMF2.GE.10.0) GOTO 501
233. CALL F2OUT(MODIP,LATI,LONGI,MAGBR,R,MONTH,HOUR,FOE,HMF2,FOF2)
234. GOTO 502
235. 501 IF(FOF2.GT.100.0) FOF2=SQRT(FOF2/1.24E+10)
236. 502 NMF2=1.24E10*FOF2*FOF2
237. NME=1.24E10*FOE*FOE
238. NMD=XMD(XHI,R,4.0E8)
239. 7000 HME=HPOL(HOUR,110.0,105.0,SAX,SUX)
240. HMD=HPOL(HOUR,81.0,88.0,SAX,SUX)
241. SMONTH=IFIX(MONTH/3.0)
242. IF(SMONTH.LT.1) SMONTH=4
243. BO=XPOL(BOF,HOUR,SAX,SUX,DELL,SMONTH,R)
244. COS2=COS(MLAT*UMR)
245. COS2=COS2*COS2
246. FLU=(COV-40.0)/30.0
247. ETA=0.058798-0.0070305*COS2+FLU*(-0.014065+0.0069724*COS2)+  

1(0.0024287+0.0042810*COS2-0.00015280*FOF2)*FOF2
248. ZETA=0.078922-0.0046702*COS2+FLU*(-0.019132+0.0076545*COS2)+  

1(0.0032513+0.0060290*COS2-0.00020872*FOF2)*FOF2
251. BETA=-128.03+20.253*COS2+FLU*(-8.0755-0.65896*COS2)+(0.44041  

1+0.71458*COS2-0.042966*FOF2)*FOF2
252. XXX=EP1ST(-94.45,BETA)
253. XXXX=DEP1ST(-94.45,BETA)
254. DELTA=(ETA*XXX-ZETA/2.0)/(ETA*XXXX+ZETA/400.0)
255. B1=3.0
256. F(1)=HPOL(HOUR,0.02+0.03/DELL,0.05,SAX,SUX)
257. F(2)=HPOL(HOUR,4.6,4.5,SAX,SUX)
258. F(3)=HPOL(HOUR,-11.5,-4.0,SAX,SUX)
259. NDELO=5.0
260. IF(WINTER) NDELO=10.0
261. DNDH0=0.016
262. IF(SUMMER) DNDH0=0.01
263. NHABR=HPOL(HOUR,10.5/DELL,28.0,SAX,SUX)
264. XXX=EPSTEP(45.0,67.0,-10.0,20.0,ABS(LATI))
265. HBR=HPOL(HOUR,17.8/DELL,XXX,SAX,SUX)
266. NDEL=HPOL(HOUR,NDELO/DELL,81.0,SAX,SUX)
267. DNDHBR=HPOL(HOUR,DNDH0/DELL,0.06,SAX,SUX)
268. IF(NDEL.GT.1.0) VALLEY=.TRUE.
269. IF(.NOT.VALLEY) GOTO 600
270. IF(TAL(HME,NME,NHABR,NDEL,HBR,1.0,DNDHBR,EXT,E)  

271. IF(.NOT.EXT) GOTO 600
272. WRITE(KONSOL,650)
273. 650 FORMAT(1X,'NO ELECTRON DENSITY E-VALLEY, AS THE  

1 MODEL FUNCTION HAS A SECOND EXTREMUM IN THE VALLEY-REGION')  

274. 600 VALLEY=.FALSE.
275. FP1=F(1)
276. FP2=-FP1*FP1/2.0
277. FP30=(-F(2)*FP2-FP1+1.0/F(2))/(F(2)*F(2))
278. FP3U=(-F(3)*FP2-FP1-1.0/F(3))/(F(3)*F(3))
279. HDX=HMD+F(2)
280. X=HDX-HMD
281. NDX=NMD*EXP(X*(FP1+X*(FP2+X*FP30)))
282. DNDX=NDX*(FP1+X*(2.0*FP2+X*3.0*FP30))
283. X=HME-HDX
284. K=-DNDX*X/(NDX*ALOG(NDX/NME))
285. D1=DNDX/(NDX*K*X**((K-1.0))
286. IF(.NOT.VALLEY) HBR=0.0
287. IF(F1REG) GOTO 700
288. HMF1=0.0
289. NMF1=0.0
290. C1=0.0
291. HEF=HME+HBR
292. C
293. 700 C      SEARCH FOR HMF1,HST,HEF,AND HA..... .
294. C
295. C
296. C

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297.    7107 IF(.NOT.F1REG) NMF1=(NME+NMF2)/2.0
298.          H=0.0
299.    133 H=H+10.0
300.          IF(H.GT.(HMF2-HME)) GOTO 135
301.          CALL REGFA1(HMF2-10.0-H,HMF2,1.0,NMF1,XE2,SCHALT,HMF1)
302.          IF(SCHALT) GOTO 133
303.          GOTO 137
304.    135 WRITE(KONSOL,11)
305.    11  FORMAT(1H ,1X,' HMF1 IS
306.          1 NOT EVALUATED BY THE FUNCTION XE2')
307.          HMF1=HMF2
308.          C1=0.0
309.    137 IF(HMF1.GT.(HEF+10.0)) GOTO 380
310.          C1=0.0
311.          HMF1=HMF2
312.          WRITE(KONSOL,9)
313.    9   FORMAT(1H ,1X,' HEF GREATER AS HMF1')
314.   380 H=0.0
315.   125 H=H+3.0
316.          IF(H.GT.(HMF1-HME)) GOTO 900
317.          CALL REGFA1(HMF1,HME+H,1.0,NME,XE3,SCHALT,HST)
318.          STR=HST
319.          IF(SCHALT) GOTO 125
320.          GOTO 360
321.   900 B1=B1+0.5
322.          IF(B1.GE.10.0) GOTO 901
323.          H=0.0
324.          GOTO 133
325.   901 WRITE(KONSOL,100)
326.   100 FORMAT(1H ,1X,' HST IS NOT
327.          1EVALUATED BY THE FUNCTION XE3')
328.          HST=(HMF1+HME-HBR)/2.0
329.   360 HZ=(HST+HMF1)/2.0
330.          WRITE (KONSOL,902) B1
331.   902 FORMAT (1X, 'WE PUT B1= ', F3.1, ' TO GET HST')
332.          IF(HZ.GT.(HEF+10.0)) GOTO 950
333.          HST=(HMF1+HEF)/2.0
334.          HZ=(HST+HMF1)/2.0
335.   950 D=HZ-HST
336.          HEF=HME+HBR
337.          T=D*D/(HZ-HEF-D)
338.    C   CALCULATION OF NEUTRAL TEMPERATURE PARAMETER.....
339.    C
340.    C
341.          HTA=90.0
342.          TNA=183.0
343.          ZX=125.0
344.          ANF=.TRUE.
345.          Z1=-180.0
346.   882 TUN=TUNCAL(COV,LATI,SUNDEC,Z1)
347.          TNX=371.6678+0.0518806*TUN-294.3505*EXP(-0.00216222*TUN)
348.          ATN=0.63662*(TUN-TNX)
349.          HDEL=ZX-HTA
350.          TDEL=TNX-TNA
351.          HD2=HDEL*HDEL
352.          CTN(1)=1.*TDEL/HDEL
353.          CTN(3)=3.0*TDEL/(HD2*HD2)
354.          CTN(2)=CTN(3)*1.333333*HDEL-CTN(1)/HD2
355.          IF(.NOT.ANF) GOTO 881
356.          ANF=.FALSE.
357.          TX=TN(130.0,TNX,ATN,CTN)
358.          TNXN=TNX
359.          ATNN=ATN
360.          CTNN(1)=CTN(1)
361.          CTNN(2)=CTN(2)
362.          CTNN(3)=CTN(3)
363.          Z1=XLSTA
364.          GOTO 882
365.    C   CALCULATION OF ELECTRON TEMPERATURE PARAMETER.....
366.    C
367.    C
368.   881 HTA=120.0
369.          HOT=200.0
370.          HON=400.0
371.          IF(ABS(MLAT).GT.40.0) HOT=350.0
372.          HO=HOT

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373.      IF(NIGHT) HO=HON
374.      HMAX=70.0*EXP((-1.4E-3)*MLAT*MLAT)+200.0
375.      CALL TELAT(MLAT,1600.0,700.0,0.5,0.47,0.024,0.0,F1N,F2N)
376.      TX=TN(HON,TNXN,ATNN,CTNN)
377.      TEN=TE(HON,F1N,F2N,HMAX,0.0,HON,0.0,0.0,0.0)
378.      DTEN=(TEN-TX)/(HON-HTA)
379.      CALL TELAT(MLAT,2325.0,725.0,1.0,3.4,-0.014,2.56E4,F1T,F2T)
380.      TX=TN(HO,TNXN,ATNN,CTNN)
381.      XXX=TE(HO,F1T,F2T,HMAX,2.0,HOT,0.0,0.0,0.0)
382.      XXXX=TE(HO,F1N,F2N,0.0,0.0,HON,HTA,DTEN)
383.      TEO=HPOL(HOUR,XXX,XXXX,SAX,SUX)
384.      TX=TN(HO,TNX,ATN,CTN)
385.      QHO=(TEO-TX)/(HO-HTA)
386.      C
387.      C CALCULATION OF ION TEMPERATURE PARAMETERS
388.      C
389. 887   XSM(1)=430.0
390.      MM(2)=HPOL(HOUR,3.0,0.0,SAX,SUX)
391.      Z1=EXP(-0.09*MLAT)
392.      YSM2=1240.0-1400.0*Z1/((1.0+Z1)*(1.0+Z1))
393.      X2=ABS(MLAT)
394.      X1=X2*(0.47+X2*0.024)*UMR
395.      X3=COS(X1)
396.      X4=YSM2
397.      TIN=1200.0-300.0*SIGN(1.0,X3)*SQRT(ABS(X3))
398.      YSM2=TIN
399.      IF(X4.GE.TIN) YSM2=HPOL(HOUR,X4,TIN,SAX,SUX)
400.      TX=TN(XSM(1),TNXN,ATNN,CTNN)
401.      XXX=TE(XSM(1),F1T,F2T,HMAX,2.0,HOT,0.0,0.0,0.0)
402.      XXXX=TE(XSM(1),F1N,F2N,0.0,0.0,HON,TX,HTA,DTEN)
403.      Z1=HPOL(HOUR,XXX,XXXX,SAX,SUX)
404.      Z2=TN(XSM(1),TNX,ATN,CTN)
405.      IF(YSM2.LE.Z2) YSM2=(Z1+Z2)/2.0
406.      CALL REGFA1(130.0,500.0,0.1,YSM2,TEDER,SCHALT,HS)
407.      IF(.NOT.SCHALT) GOTO 250
408.      HS=200.0
409. 250   TNHS=TN(HS,TNX,ATN,CTN)
410.      MM(1)=DTNDH(HS,ATN,CTN)
411.      MM(3)=MM(2)
412.      XSM(2)=XSM(1)
413.      C
414.      C SMOOTHING OF THE ION TEMPERATURE TO KEEP IT LESS THAN
415.      C THE ELECTRON TEMPERATURE AT HSM
416.      C
417.      HSM=1000.0
418.      XXX=TE(HSM,F1T,F2T,HMAX,2.0,HOT,0.0,0.0,0.0)
419.      XXXX=TE(HSM,F1N,F2N,HMAX,0.0,HON,0.0,0.0,0.0)
420.      TESM=HPOL(HOUR,XXX,XXXX,SAX,SUX)
421.      IF(TESM.GE.TI(HSM)) GOTO 240
422.      XXX=DTEDH(HSM,F2T,HMAX,2.0,HOT,0.0,0.0)
423.      XXXX=DTEDH(HSM,F2N,HMAX,0.0,HON,0.0,0.0)
424.      MM(3)=HPOL(HOUR,XXX,XXXX,SAX,SUX)
425.      XSM(2)=(TESM-10.0-YSM2+MM(2)*XSM(1)-MM(3)*HSM)/(MM(2)-MM(3))
426.      C
427.      C CALCULATION OF ION DENSITY PARAMETER.....
428.      C
429. 240   IF(IOND.LT.1) GOTO 189
430.      Z1=0.0
431.      IF(XHI.LE.90.0) Z1=COSXHI
432.      HFIX0=300.0
433.      IF((IIF(2).EQ.2).AND.(IIF(3).EQ.2)) HFIX0=249.0
434.      M0(1)=EPSTEP(PF10(1),PF10(2),PF10(3),PF10(4),Z1)
435.      M0(2)=EPSTEP(PF10(5),PF10(6),PF10(7),PF10(8),Z1)
436.      M0(3)=0.0
437.      H0(1)=EPSTEP(PF10(9),PF10(10),PF10(11),PF10(12),Z1)
438.      H0(4)=PF20(1)
439.      M0(4)=PF20(2)
440.      M0(5)=PF20(3)
441.      DDO(1)=9
442.      DDO(2)=5
443.      DDO(3)=5
444.      DDO(4)=50
445. 7100   H0(2)=290.0
446.      IF((IIF(2).EQ.2).AND.(IIF(3).EQ.2)) H0(2)=237.0
447.      H0(3)=(4.60517-M0(5)*(H0(4)-PF20(4)))/M0(4)+H0(4)
448.      IF(H0(2).LT.H0(3)) GOTO 7101

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449.      MO(4)=MO(4)-0.001
450.      GOTO 7100
451. 7101 Z2=5.0
452.      X=H0(2)
453.      Z1=0.0
454. 7102 X=X+Z2
455.      Y=RPID(X,HFIX0,98.0,4,MO,DDO,H0)
456.      IF(Y.LE.Z1) GOTO 7103
457.      Z1=Y
458.      GOTO 7102
459. 7103 IF(Z2.LE.1.0) GOTO 7104
460.      X=X-Z2
461.      Z2=1.0
462.      GOTO 7102
463. 7104 H00=X-0.5
464.      IF(XHI.GE.90.0) COSXHI=0.0
465.      DO 7105 I=2,4,2
466.      L=I/2
467.      H02(L)=PF30(1+I)+PF30(2+I)*COSXHI
468. 7105 M02(L+1)=PF30(7+I)+PF30(8+I)*COSXHI
469.      D02(1)=5
470.      D02(2)=5
471.      M02(1)=PF30(7)+PF30(8)*COSXHI
472. 7106 Y=RPID(H00,PF30(1),PF30(2),2,M02,D02,H02)
473.      IF(Y.LE.0.1) GOTO 189
474.      M02(3)=M02(3)-0.02
475.      GOTO 7106
476. C
477. C      CALCULATION FOR THE REQUIRED HEIGHT RANGE..... .
478. C
479. 189  HA=65.0
480.      IF(NIGHT) HA=80.0
481.      IF(AH.LT.HA) AH=HA
482.      IF(EH.GT.1000.0) EH=1000.0
483.      KOMB=JF(4)+JF(5)+JF(6)
484.      IF(((EH-AH)/SH+1.0).LT.50.0) GOTO 230
485.      EH=AH+49.0*SH
486.      WRITE(AGNR,190) EH
487. 190  FORMAT(1H ,1X,' TOO MANY HEIGHT STEPS,EH IS REDUCED
488.      1 TO ',F4.0)
489. 230  I=0
490.      X=EH
491. 300  I=I+1
492.      IN=1
493.      OUTF(I,IN)=X
494.      IF((JF(1)+JF(2)).LE.0) GOTO 330
495.      NEI=XE(X)
496.      IF(JF(1).LE.0) GOTO 340
497.      IN=IN+1
498.      OUTF(I,IN)=NEI
499. 340  IF(JF(2).LE.0) GOTO 330
500.      IN=IN+1
501.      OUTF(I,IN)=NEI/NMF2
502. 330  IF(KOMB.LE.0) GOTO 7108
503.      X1=TN(X,TNX,ATN,CTN)
504.      IF(X.GE.HTA) GOTO 7109
505.      Z2=-1.0
506.      TEH=-1.0
507.      GOTO 7110
508. 7109 TX=TN(X,TNXN,ATNN,CTNN)
509.      Z1=TE(X,F1N,F2N,HMAX,0.0,HON,DX,HTA,DTEN)
510.      Z2=X1
511.      IF(X.GE.HS) Z2=TI(X)
512.      IF(X.LT.HO) GOTO 7119
513.      XXX=TE(X,F1T,F2T,HMAX,2.0,HOT,0.0,0.0,0.0)
514.      TEH=HPOL(HOUR,XXX,Z1,SAX,SUX)
515.      GOTO 7110
516. 7119 TEH=TE(X,0.0,0.0,0.0,0.0,HO,X1,HTA,QU0)
517. 7110 IF(JF(3).LE.0) GOTO 7112
518.      IN=IN+1
519.      OUTF(I,IN)=X1
520. 7112 IF(JF(4).LE.0) GOTO 7113
521.      IN=IN+1
522.      OUTF(I,IN)=TEH
523. 7113 IF(JF(5).LE.0) GOTO 7120
524.      IN=IN+1

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525.      OUTF(I,IN)=Z2
526. 7120  IF(JF(6).LE.0) GOTO 7108
527.      IN=IN+1
528.      OUTF(I,IN)=SIGN(1.0,TEH)*TEH/Z2
529. 7108  IF(IOND.LE.0) GOTO 7118
530.      Z1=RPID(X,HFIX0,98.0,4,M0,DD0,H0)
531.      Z2=RPID(X,PF30(1),PF30(2),2,M02,D02,H02)
532. C   FIRST COMPUTE NOB02, RATIO OF NO+T002+
533. C   AT HEIGHT HB. THEN THE SAME RATIO AT X
534.      Z1B= RPID (H00,HFIX0,98.0,4,M0,DD0,H0)
535.      Z2B= RPID (H00,PF30(1),PF30(2),2,M02,D02,H02)
536.      NOB02= (100.0-Z1B-Z2B)/Z2B
537.      IF(JF(7).LE.0) GOTO 7114
538.      IN=IN+1
539.      OUTF(I,IN)=Z1
540. 7114  IF(JF(8).LE.0) GOTO 7116
541.      IN=IN+1
542.      CALL RDHHE(X,H00,Z1,Z2,NOB02,10.0,OUTF(I,IN),OUTF(I,IN+1))
543. 7116  IF(JF(9).LE.0) GOTO 7117
544.      IN=IN+2
545.      OUTF(I,IN)=Z2
546. 7117  IF(JF(10).LE.0) GOTO 7118
547.      IN=IN+1
548.      OUTF(I,IN)=RDNO(X,H00,Z2,Z1,NOB02)
549. 7118  X=X-SH
550.      IF(X.GE.AH) GOTO 300
551.      IEI=I
552. C
553. C   OUTPUT ON THE SPECIFIED DEVICE.....
554. C
555.      IF(KOBE.NE.1) GOTO 7020
556.      WRITE(AGNR,7030) (JF(I),I=1,10),IEI,LATI,LONGI,R,MONTH,HOUR
557. 7030  FORMAT(1X,10I1,2X,I3,2(2X,F6.1),2X,F5.1,2X,F4.1,2X,F5.2)
558. 7020  IF(KOBE.NE.0) GOTO 7041
559.      WRITE(AGNR,7051)
560. 7051  FORMAT(1X,'INPUT@')
561.      IF (JMAG.LT.1) GOTO 7053
562.      WRITE(AGNR,7052) MLAT,MLONG
563. 7052  FORMAT(1X,'MLAT=',F6.1,2X,'MLONG=',F6.1)
564.      GOTO 7055
565. 7053  WRITE(AGNR,7054) LATI,LONGI
566. 7054  FORMAT(1X,'LATI=',F6.1,2X,'LONGI=',F6.1)
567. 7055  WRITE(AGNR,7050) R,MONTH,HOUR
568. 7050  FORMAT(1X,'R=',F5.0,' MONTH=',F4.1,' HOUR=',F5.2)
569.      WRITE(AGNR,7061)
570. 7061  FORMAT(1X,'CALCULATED VALUES@')
571.      IF (JMAG.LT.1) GOTO 7063
572.      WRITE(AGNR,7062) LATI,LONGI
573. 7062  FORMAT(1X,'LATI=',F6.1,2X,'LONGI=',F6.1)
574.      GOTO 7065
575. 7063  WRITE(AGNR,7064)MLAT,MLONG
576. 7064  FORMAT(1X,'MLAT=',F6.1,2X,'MLONG=',F6.1)
577. 7065  WRITE(AGNR,7060) DIP,MODIP,MAGBR,XHI
578. 7060  FORMAT(1X,'DIP=',F6.1,' MODIP=',F6.1,' MAGLA=',F6.1,' XHI=',F6.1)
579.      WRITE(AGNR,7066) SAX,SUX,SUNDEC
580. 7066  FORMAT(1X,'SUNRISE',F4.1,'L.T. SUNSET@',F4.1,'L.T.',5X,
581. X'SUNDEC.= ',F6.1)
582.      Z1=0.0
583.      IF(F1REG) Z1=HMF1
584.      Z2=0.0
585.      IF(F1REG) Z2=NMF1
586.      WRITE(AGNR,7070) NMF2,Z2,NME,NMD
587. 7070  FORMAT(1X,'NMF2=',E7.2,' NMF1=',E7.2,' NME=',E7.2,' NMD=',E7.2)
588.      WRITE(AGNR,7080) HMF2,Z1,HME,HMD
589. 7080  FORMAT(1X,'HMF2=',F5.1,' HMF1=',F5.1,' HME=',F5.1,' HMD=',F5.1)
590.      WRITE(AGNR,7998)
591. 7998  FORMAT(1HO,3X,1HH,9X,2HNE,7X,6HN/NMAX,5X,2HTN,7X,2HTE,7X,2HTI,
592. 16X,5HTE/TI,5X,4HRD0+,4X,4HRDH+,3X,5HRDHE+,3X,5HRD02+,3X,5HRDN0+)
593. 7041  DO 7040 I=1,IEI
594. 7040  WRITE(AGNR,7999) (OUTF(I,L),I=1,IN)
595. 7999  FORMAT(1X,F6.1,3X,E10.4,3X,F6.4,3X,3(F6.1,3X),F7.4,5(3X,F5.1))
596.      IF(KOBE.EQ.1) WRITE(AGNR,35)
597. 35    FORMAT(1X,'111111')
598. C
599. C
600. C-WDC-A ADD A 'GO TO 2000' IF YOU WISH TO READ THE DATA FOR MORE THAN

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601. C-WDC-A ONE HOUR TO A RUN.
602. C
603. 999 STOP
604. END

605. C D.BILITZA,IPW FREIBURG,15.1.77 ****
606. C 'COMMENT' D. BILITZA,H.THIEMANN,K.RAWER IPW FREIBURG,
607. C AUG.79 ****
608. C IRI-PROCEDURES ****
609. C FREF.@ K. RAWER, S. RAMAKRISHNAN, D. BILITZA,
610. C INTERNATIONAL REFERENCE IONOSPHERE 1978, U.R.S.I. BRUSSELS'
611. C FOR CALCULATING ELECTRON DENSITY AND TEMPERATURE AND ION TEMPERATURE
612. C AND RELATIVE DENSITY IN THE HEIGHT RANGE 70 - 1000 KM.?
613. C IRI-PROCEDURES
614. C REF.@ K. RAWER, S. RAMAKRISHNAN, D. BILITZA'
615. C TO CALCULATE ELECTRON DENSITY AND TEMPERATURE AND ION TEMPERATURE
616. C AND RELATIVE DENSITY IN THE HEIGHT RANGE 70 - 1000 KM.
617. C I. ELECTRON DENSITY -----
618. FUNCTION EP1ST(X,BET)
619. EP1ST=1.0/(1.0+EXP(-X/BET))
620. RETURN
621. END

622. FUNCTION DEP1ST(X,BET)
623. U=EXP(-X/BET)
624. DEP1ST=U/(BET*(1.0+U)*(1.0+U))
625. RETURN
626. END

627. FUNCTION XE1(H)
628. C K.RAWER, S. RAMAKRISHNAN 1978. REPRESENTING ELECTRON DENSITY
629. C PROFILE
630. C FOR HEIGHTS NOT GREATER 1000 KM AND NOT LESS HMF2
631. C BY HARMONIZED BENT-MODEL ADMITTING VARIABILITY OF
632. C GLOBAL PARAMETERS@ ETA, ZETA, BETA, DELTA WITH GEOMAGNETIC LATITUDE
633. C MLAT, SOLAR FLUXFLU AND CRITICAL FREQUENCY FOF2.
634. C ALSO GLOBAL ARE PEAK-PARAMETERS NMF2,HMF2?
635. C REAL NMF2
636. COMMON/BLOCK1/HMF1,NMF2,HMF1,BL010/BETA,ETA,DELTA,ZETA
637. X=(H-HMF2)/(1000.0-HMF2)*700.0+300.0-DELTA
638. Y=(1000.0-HMF2)/700.0*0*(BETA*ETA*ALOG((1.0+EXP((X-394.50)/BETA)))
639. 1*(1.0+EXP((-94.5-DELTA)/BETA)))+ZETA*(100.0*ALOG((1.0+EXP
640. 2*((X-300.0)/100.0))/(1.0+EXP(-DELTA/100.0))-X+300.0-DELTA))
641. XE1=NMF2*EXP(-Y)
642. RETURN
643. END

644. REAL FUNCTION XE2(H)
645. C ELECTRON DENSITY FOR HEIGHTS LESS HMF2 AND NOT LESS HMF1
646. C REAL NMF2
647. COMMON/BLOCK1/HMF2,NMF2,HMF1/BLOCK2/B0,B1,C1,HZ,T,G(144),HST,STR
648. X=(HMF2-H)/B0
649. IF(ABS(X).LT.1.0E-10) GOTO 100
650. XE2=NMF2*EXP(-X**B1)/COSH(X)
651. GOTO 200
652. 100 XE2=NMF2
653. 200 RETURN
654. END

655. REAL FUNCTION XE3(H)
656. C ELECTRON DENSITY FOR HEIGHTS LESS HMF1 AND NOT LESS HZ
657. C REAL NMF2
658. COMMON/BLOCK1/HMF2,NMF2,HMF1/BLOCK2/B0,B1,C1,HZ,T,G(144),HST,STR
659. XE3=XE2(H)+NMF2*C1*SQRT(ABS(HMF1-H)/B0)
660. RETURN
661. END

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662. C REAL FUNCTION XE4(H)
663. C ELECTRON DENSITY FOR HEIGHTS LESS HZ AND NOT LESS HEF
664. COMMON/BLOCK2/B0,B1,C1,HZ,T,G(144),HST,STR/BLOCK3/
665. 1HDX,HME,NME,HMD,NMD,HEF,D1,K,FP30,FP3U,FP1,FP2
666. A=((STR/HST-1)*(H-HZ))/(HEF-HZ)+1
667. XE4=XE3 (A*(HZ+T/2.0-SIGN(1.0,T)*SQRT(T*(HZ-H+T/4.0)))) )
668. RETURN
669. END

670. C REAL FUNCTION XE5(H)
671. C ELECTRON DENSITY FOR HEIGHTS LESS HEF AND NOT LESS HME(VALLEY-REGION)
672. REAL NME,NMD,K
673. LOGICAL NIGHT
674. COMMON/BLOCK3/HDX,HME,NME,HMD,NMD,HEF,D1,K,FP30,FP3U,FP1,
675. 1FP2/BLOCK6/NIGHT,E(4)
676. T3=H-HME
677. T1=T3*T3*(E(1)+T3*(E(2)+T3*(E(3)+T3*E(4)))) )
678. IF(NIGHT) GOTO 100
679. XE5=NME*(T1+1.0)
680. GOTO 200
681. 100 XE5=NME*EXP(T1)
682. 200 RETURN
683. END

684. C REAL FUNCTION XE6(H)
685. C ELECTRON DENSITY FOR HEIGHTS LESS HME AND NOT LESS HA
686. REAL NME,NMD,K
687. COMMON/BLOCK3/HDX,HME,NME,HMD,NMD,HEF,D1,K,FP30,FP3U,FP1,FP2
688. IF(H.GT.HDX) GOTO 100
689. Z=H-HMD
690. FP3=FP3U
691. IF(Z.GT.0.0) FP3=FP30
692. XE6=NMD*EXP(Z*(FP1+Z*(FP2+Z*FP3)))
693. GOTO 200
694. 100 Z=HME-H
695. 200 XE6=NME*EXP(-D1*Z**K)
696. 200 RETURN
697. END

698. C REAL FUNCTION XE(H)
699. C ELECTRON DENSITY BETWEEN HA(KM) AND 1000 KM.FUNCTIONS NE1...6 ARE USED.
700. C ELECTRON DENSITY BETWEEN HA(KM) AND 1000 KM
701. C SUMMARIZING PROCEDURES NE1...6?
702. REAL NMF2,NME,NMD,K
703. COMMON/BLOCK1/HMF2,NMF2,HMF1/BLOCK2/B0,B1,C1,
704. 1HZ,T,G(144),HST,STR/BLOCK3/HDX,H
705. 1ME,NME,HMD,NMD,HEF,D1,K,FP30,FP3U,FP1,FP2
706. IF(H.LT.HMF2) GOTO 100
707. XE=XE1(H)
708. GOTO 200
709. 100 IF(H.LT.HMF1) GOTO 300
710. XE=XE2(H)
711. GOTO 200
712. 300 IF(H.LT.HZ) GOTO 400
713. XE=XE3(H)
714. GOTO 200
715. 400 IF(H.LT.HEF) GOTO 500
716. XE=XE4(H)
717. GOTO 200
718. 500 IF(H.LT.HME) GOTO 600
719. XE=XE5(H)
720. GOTO 200
721. 600 XE=XE6(H)
722. 200 RETURN
723. END
724. C II. ELECTRON TEMPERATURE -----
725. FUNCTION DTEDH(H,F2,HMAX,D,H0,DTNDH,A)
726. C D.BILITZA,1.7.78,CALCULATES THE HEIGHT DERIVATIVE OF THE
727. C ELECTRON TEMPERATURE MODEL PROCEDURE TE
728. C IF(H.LT.H0) GOTO 100
729. C Y=EXP(-0.03*(H-HMAX))

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730.      F=1.0+Y
731.      DTEDH=D-F2*0.03*Y*(1.0-Y)/(F*F*F)
732.      RETURN
733. 100   DTEDH=DTNDH+A
734.      RETURN
735.      END

736.      SUBROUTINE TELAT(PHI,A,B,XN,P1,P2,C,F1,F2)
737. C      D.BILITZA,1.7.78,CALCULATES THE TEMPERATURE MODEL PARTS F1 AND F2
738. C      DEPENDING ON GEOMAGNETIC LATITUDE PHI
739.      XPHI=ABS(PHI)
740.      F=(P1+P2*XPHI)*XPHI
741.      F=F*0.01745329
742.      Y=COS(F)
743.      F1=A-B*SIGN(1.0,Y)*ABS(Y)**XN
744.      Y=EXP(-0.1*XPHI)
745.      F=1.0+Y
746.      F2=C*Y/(F*F)
747.      RETURN
748.      END

749.      FUNCTION TE(H,F1,F2,HMAX,D,HH0,TNH,HTA,A)
750. C      D.BILITZA,1.7.78,MODEL FOR THE ELECTRON TEMPERATURE IN THE HEIGHT RANGE
751. C      120-1000 KM.F1,F2 ARE THE LATITUDE DEPENDENT PARAMETERS CALCULATED BY
752. C      TELAT.HMAX IS THE HEIGHT OF THE RELATIVE MAXIMUM,D THE TEMPERATURE
753. C      HEIGHT GRADIENT,HH0 THE INTERSECTION HEIGHT FOR THE EXTRAPOLATION TO THE
754. C      CIRA 72 VALUES TNA AT HTA AND A,TNA ARE THE COEFFICIENTS FOR THE
755. C      EXTRAPOLATION FUNCTION
756.      IF(H.LT.HH0) GOTO 10
757.      Y=EXP(-0.03*(H-HMAX))
758.      F=1.0+Y
759.      TE=F1+F2*Y/(F*F)+D*(H-700.0)
760.      RETURN
761. 10    TE=TNH+A*(H-HTA)
762.      RETURN
763.      END

764.      C      III. ION TEMPERATURE -----
765.      FUNCTION TUNCAL(COV,XLATI,SD,SLSTA)
766.      C      CALCULATES THE EXOSPHERIC TEMPERATURE FOR COVINGTON-INDEX
767.      C      COV,LATITUDE XLATI,SOLARDEKLINATION SD AND LOCAL SOLAR TIME
768.      C      ANGLE SLSTA USING CIRA72-MODEL
769.      UMR=0.01745329
770.      TC=379.0+3.24*COV
771.      ETA=ABS(XLATI-SD)/2.0
772.      THETA=ABS(XLATI+SD)/2.0
773.      H1=COS(ETA*UMR)**2.2
774.      H2=SIN(THETA*UMR)**2.2
775.      TD=1.0+0.3*H1
776.      TN=1.0+0.3*H2
777.      A=(TD-TN)/TN
778.      TAU=SLSTA-37.0+6.0*SIN((SLSTA+43.0)*UMR)
779.      X=COS(TAU/2.0*UMR)
780.      TUNCAL=TC*TN*(1.0+A*SIGN(1.0,X)*ABS(X)**3.0)
781.      RETURN
782.      END

783.      C      REAL FUNCTION TN(X,TTNX,ATN,CCTN)
784.      C      D. BILITZA, 1978, NEUTRAL TEMPERATURE PROFILE
785.      DIMENSION CCTN(3)
786.      Z=X-125.0
787.      IF(Z.LE.0.0) GOTO 100
788.      Y=Z**2.5
789.      Y=(1.0+(4.5E-6)*Y)*Z
790.      YY=CCTN(1)/ATN
791.      Y=YY*Y
792.      Y=ATAN(Y)*ATN
793.      TN=TTNX+Y
794.      GOTO 200
795. 100   TN=TTNX+Z*(CCTN(1)+Z*CCTN(2)+Z*CCTN(3)))
796. 200   RETURN
797.      END

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798.      FUNCTION DTNDH(H,ATN,CCTN)
799.      C DERIVATIVE OF NEUTRAL TEMPERATURE
800.      DIMENSION CCTN(3)
801.      Z=H-125.0
802.      IF(Z.GT.0.0) GOTO 100
803.      DTNDH=CCTN(1)+Z*Z*(3.0*CCTN(2)+Z*4.0*CCTN(3))
804.      RETURN
805. 100   H1=CCTN(1)/ATN
806.      H2=Z**2.5
807.      H3=H1*Z*(1.0+(4.5E-6)*H2)
808.      DTNDH=ATN/(1.0+H3*H3)*H1*(1.0+(15.75E-6)*H2)
809.      RETURN
810.      END

811.      REAL FUNCTION TI(H)
812.      C ION TEMPERATURE FOR HEIGHTS NOT GREATER 1000 KM AND NOT LESS HS
813.      REAL MM,G(2)
814.      COMMON/BLOCK8/HS,TNHS,XSM(2),MM(3)
815.      G(1)=20.0
816.      G(2)=50.0
817.      SUM=MM(1)*(H-HS)+TNHS
818.      DO 100 I=1,2
819.      A=H-XSM(I)
820.      IF((H-XSM(I)).LT.(100.0*G(I))) A=G(I)*ALOG(1.0+EXP((H-XSM(I)))
821.      1/G(I)))
822.      B=HS-XSM(I)
823.      IF((HS-XSM(I)).LT.(100.0*G(I))) B=G(I)*ALOG(1.0+EXP((HS-XSM(I)))
824.      1/G(I)))
825. 100   SUM=SUM+(MM(I+1)-MM(I))*(A-B)
826.      TI=SUM
827.      RETURN
828.      END

829.      REAL FUNCTION TEDER(H)
830.      C THIS FUNCTION TOGETHER WITH THE SUBROUTINE REGFA1 IS USED TO FIND THE
831.      C HEIGHT WHERE DIFFERENCE BETWEEN TN AND TI BEGINS
832.      REAL MM
833.      COMMON/BLOCK5/ZX,TNX,ATN,CTN(3)/BLOCK8/HS,TNHS,XSM(2),MM(3)
834.      TNH=TN(H,TNX,ATN,CTN)
835.      DTDX=DTNDH(H,ATN,CTN)
836.      TEDER=DTDX*(XSM(1)-H)+TNH
837.      RETURN
838.      END
839.      C IV. ION RELATIVE PRECENTAGE DENSITY

840.      REAL FUNCTION RPID (H, HO, NO, M, ST, ID, XS)
841.      C THIS ANALYTIC FUNCTION IS USED TO REPRESENT THE RELATIVE
842.      C PERCENTAGE DENSITY OF ATOMIC AND MOLECULAR OXYGEN IONS.
843.      C THE M+1 HEIGHT GRADIENTS ST(M+1) ARE CONNECTED WITH EPSTEIN-
844.      C STEP-FUNCTIONS AT THE STEP HEIGHTS XS(M) WITH TRANSITION
845.      C THICKNESSES ID(M). RPID(HO,HO,NO,...)=NO.
846.      C INSTEAD OF 88.0 YOU MUST USE THE HIGHEST ALLOWED ARGUMENT
847.      C FOR EXP AT YOUR COMPUTER.
848.      REAL NO
849.      DIMENSION ID(4), ST(5), XS(4)
850.      SUM=(H-HO)*ST(1)
851.      DO 100 I=1,M
852.      A=H-XS(I)
853.      XI=FLOAT(ID(I))
854.      IF (A.LT.88.0*XI) A=XI*ALOG(1.0+EXP(A/XI))
855.      B=HO-XS(I)
856.      C
857.      IF (B.LT.88.0*XI) B=XI*ALOG(1.0+EXP(B/XI))
858. 100   SUM=SUM+(ST(I+1)-ST(I))*(A-B)
859.      SUM=NO*EXP(SUM)
860.      IF (SUM.LT.1.0E-10) SUM=0.0
861.      RPID=SUM
862.      RETURN
863.      END

864.      SUBROUTINE RDHHE (H,HB,RDOH,RD02H,RNO,PEHE,RDH,RDHE)
865.      C RAWER, OCT.79, H+ AND HE+ RELATIVE PERCENTAGE
866.      C DENSITY FOR HEIGHTS NOT GREATER THAN 1000 KM.
867.      C RNO IS THE RATIO OF NO+TO O2+DENSITY AT H=HB.

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868. C      WHERE NO + PEAKS.
869. IF (H-HB)100,100,200
870. 100 RDH=0.0
871. GOTO 300
872. 200 RDH=(100.0-RDOH-(1.0+RNO)*RD02H)*(1.0-PEHE/100.0)
873. 300 RDHE=RDH*PEHE/(100.0-PEHE)
874. RETURN
875. END

876.      REAL FUNCTION RDNO(H,HB,RD02H,RDOH,RNO)
877. C      D.BILTZA, 1978. NO+RELATIVE PERCENTAGE
878. C      DENSITY FOR HEIGHTS NOT LESS THAN 100 KM.
879. IF (H-HB) 100,100,200
880. 100 Y=100.0-RD02H-RDOH
881. GOTO 300
882. 200 Y=RNO*RD02H
883. 300 IF(Y.LT.0.0005) Y=0.0
884. RDNO=Y
885. RETURN
886. END
887. C      END IRI-FUNCTIONS*****
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888.      REAL FUNCTION XMDED (XHI,R,XW)
889. C      BILITZA, 24.3.78, CALCULATES THE ELECTRON DENSITY OF
890. C      THE D REGION RELATIVE MAXIMUM. XHI IS THE SUN ZENITH ANGLE,
891. C      R THE ZUERICH SUNSPOT NUMBER AND XW THE DESIRED NIGHT VALUE
892. Y=6.05+0.088*R
893. YW=XW/1.0E8
894. Z=(-0.1/(ALOG(YW/Y)))**0.3704
895. SUXHI=ACOS(Z)
896. IF (SUXHI.LT.1.0472) SUXHI=1.0472
897. XXHI=XHI/57.2957795
898. IF (XXHI.GT.SUXHI) GOTO 100
899. X=COS(XXHI)
900. XMDED=Y*1.0E8*EXP(-0.1/X**2.7)
901. RETURN
902. 100 XMDED=YW*1.0E8
903. RETURN
904. END

905.      REAL FUNCTION FOEEDI(R,XHI,XHIM,SLATI,ST,SU,SA)
906. C      BILITZA,17.5.1977,CALCULATES FOE BY THE EDINBURGH-METHOD.
907. C      INPUT@ COVINGTON-INDEX (COV), SOLAR ZENITH-ANGLE ACTUAL (XHI) AND FOR
908. C      MIDDAY (XHIM),LATITUDE (SLATI),SUNSET,AND SUNRISE (SU,SA/HOUR)
909. C      REF. KOURIS-MUGGLETON, CCIR DOC. 6/3/07 SEPT.73'
910. XLATI=ABS(SLATI)
911. COV=63.75+R*(0.728+0.00089*R)
912. A=1.0+0.0094*(COV-66.0)
913. SL=COS(XLATI*0.0174533)
914. IF(XLATI.LT.32.0) GOTO 100
915. SM=0.11-0.49*SL
916. C=92.0+35.0*SL
917. GOTO 400
918. 100 SM=-1.93+1.92*SL
919. C=23.0+116.0*SL
920. 400 IF(XHIM.GT.89.0) XHIM=89.0
921. B=COS(XHIM*0.0174533)**SM
922. SP=1.31
923. IF(XLATI.GT.12.0) SP=1.2
924. DX=0.0
925. IF(XHI.GT.73.0.AND.XHI.LE.90.0) DX=(6.27E-13)*(XHI-50.0)**8.0
926. IF(ST.GT.SU) GOTO 300
927. IF(ST.GT.SA) GOTO 600
928. D=0.077**SP*EXP(-1.68*(SA-ST))
929. GOTO 200
930. 600 D=COS((XHI-DX)*0.0174533)**SP
931. GOTO 200
932. 300 D=0.077**SP*EXP(-1.01*(ST-SU))
933. 200 FOE=A*B*C*D
934. SP=1.0+0.0098*R
935. SMIN=0.017*SP*SP
936. IF(FOE.LT.SMIN) FOE=SMIN
937. FOEEDI=(FOE)**0.25
938. RETURN
939. END
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940.      REAL FUNCTION FOF1ED(YLATI,R,COSXHI)
941.      C D. BILITZA,CALCULATES FOF1 FOR DIP- LATITUDE YLATI,THE ZUERICH
942.      C SUNSPOT NUMBER R AND THE COSINUS OF THE SOLAR ZENITH ANGLE
943.      C COSXHI.
944.      C REF. E. D. DUCHARME E. A.,RADIO SCIENCE,8,837-839,1973
945.      C HOWEVER WITH MAGNETIC INSTEAD OF GEOMAGNETIC LATITUDE(EYFRIG,1979)
946.      C XLATI=ABS(YLATI)
947.      C F0=4.35+XLATI*(0.0058-(1.2E-4)*XLATI)
948.      C F100=5.348+XLATI*(0.011-(2.3E-4)*XLATI)
949.      C FS=F0+(F100-F0)*R/100.0
950.      C XMUE=0.093+XLATI*(0.0046-(5.4E-5)*XLATI)+(3.0E-4)*R
951.      C FOF1ED=FS*COSXHI**XMUE
952.      C RETURN
953.      C END

954.      REAL FUNCTION HMF2ED(XMAGBR,R,X,XM3)
955.      C D. BILITZA,CALCULATES HMF2 FOR THE MAGNETIC LATITUDE XMAGBR
956.      C AND THE ZUERICH SUNSPOT NUMBER R BY USING XM3 AND THE RATIO
957.      C X=FOF2/FOE.
958.      C REF. D. BILITZA ET. AL. TO BE PUBLISHED IN@ TELECOMM.J.'
959.      C F1=(2.32E-3)*R+0.222
960.      C F2=1.2-(1.16E-2)*EXP((2.39E-2)*R)
961.      C F3=0.096*(R-25.0)/150.0
962.      C DELM=F1*(1.0-R/150.0*EXP(-XMAGBR*XMAGBR/1600.0))/(X-F2)+F3
963.      C HMF2ED=1490.0/(XM3+DELM)-176.0
964.      C RETURN
965.      C END

966.      SUBROUTINE REGFA1(X11,X22,EPS,FW,F,SCHALT,X)
967.      C REGULA-FALSI-PROCEDURE TO FIND X WITH F(X)-FW=0.X1,X2 ARE THE STARTING
968.      C VALUES.IF THE X-INTERVAL IS LESS EPS,THE PROCEDURE ENDS.
969.      C IF SIGN(1.0,F(X1)-FW)=SIGN(1.0,F(X2)-FW) SCHALT=TRUE.
970.      C LOGICAL L1,LINKS,K,SCHALT
971.      C SCHALT=.FALSE.
972.      C X1=X11
973.      C X2=X22
974.      C F1=F(X1)-FW
975.      C F2=F(X2)-FW
976.      C IF(ABS(SIGN(1.0,F1)-SIGN(1.0,F2))-10E-10) 100,110,110
977.      110 K=.FALSE.
978.      C NG=2
979.      200 X=(X1*F2-X2*F1)/(F2-F1)
980.      C GOTO 400
981.      300 L1=LINKS
982.      C IF(LINKS) GOTO 500
983.      C X=X1+FLOAT(NG-1)*(X2-X1)/FLOAT(NG)
984.      C GOTO 400
985.      500 X=X1+(X2-X1)/FLOAT(NG)
986.      400 FX=F(X)-FW
987.      C LINKS=SIGN(1.0,F1)*SIGN(1.0,FX).GT.0
988.      C K=.NOT.K
989.      C IF(LINKS) GOTO 600
990.      C X2=X
991.      C F2=FX
992.      C GOTO 700
993.      600 X1=X
994.      C F1=FX
995.      700 IF(ABS(X2-X1).LE.EPS) GOTO 800
996.      C IF(K) GOTO 300
997.      C IF((LINKS.AND.(.NOT.L1)).OR.(.NOTLINKS.AND.L1)) NG=2*NG
998.      C GOTO 200
999.      100 X=0.0
1000.     C SCHALT=.TRUE.
1001.     800 RETURN
1002.     C END

1003.     SUBROUTINE TAL(SHMAX,STMAX,SHABR,SDELTA,SHBR,STE0,SDTDHO,AUS6,SPT)
1004.     C D. BILITZA,15.1.77,CALCULATION OF THE COEF. SPT(4) FOR A POLYNOM OF
1005.     C 5TH DEGREE (K1=1,K2=SPT(1),...,K5=SPT(4),WHICH FITS TO THE
1006.     C VALLEY WITH THE PARAMETERS@ SHABR=HMIN-SHMAX,SDELTA IS THE
1007.     C PERCENTAGE DEPTH,SHBR THE WIDTH,STE0 THE UPPER FIXPOINT
1008.     C NORMALISED TO STMAX AND SDTDHO IS THE LOGARITHMIC DEVIATION AT
1009.     C THIS FIXPOINT.IF THERE IS A MINIMUM OR A SECOND MAXIMUM IN THE

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1010. C VALLEY REGION AUS6=.TRUE.
1011. DIMENSION SPT(4)
1012. LOGICAL AUS6
1013. X=SHABR
1014. Y=SHBR
1015. IF(SDELTA.LE.60.0) GOTO 100
1016. Z1=ALOG(1.0-SDELTA/100.0)/(X*X)
1017. Z2=ALOG(STE0)/(Y*Y)
1018. Z3=SDTDHO/(2.0*Y)
1019. GOTO 200
1020. 100 Z1=-SDELTA/(X*X*100.0)
1021. Z2=(STE0-1.0)/(Y*Y)
1022. Z3=SDTDHO*STE0/(2.0*Y)
1023. 200 Z4=X-Y
1024. SPT(4)=2.0*(Z1*(Y-2.0*X)*Y-Z2*(X-2.0*Y)*X+Z3*Z4*X)/(X*Y*Z4*Z4*Z4)
1025. SPT(3)=(Z1*(2.0*Y-3.0*X)+Z2*X)/(X*Z4*Z4)-(2.0*X+Y)*SPT(4)
1026. SPT(2)=-2.0*Z1/X-2.0*X*SPT(3)-3.0*X*X*SPT(4)
1027. SPT(1)=Z1-X*(SPT(2)+X*(SPT(3)+X*SPT(4)))
1028. AUS6=.FALSE.
1029. Z1=(4.0*SPT(3)+5.0*SPT(4)*X)/(10.0*SPT(4))
1030. Z2=Z1*Z1+2.0*SPT(1)/(5.0*SPT(4)*X)
1031. IF(Z2.LT.0.0) GOTO 300
1032. Z3=SQRT(Z2)
1033. Z2=-1.0*Z1+Z3
1034. IF(Z2.GT.0.0.AND.Z2.LT.Y) AUS6=.TRUE.
1035. Z2=-1.0*Z1-Z3
1036. IF(Z2.GT.0.0.AND.Z2.LT.Y) AUS6=.TRUE.
1037. 300 RETURN
1038. END

1039. REAL FUNCTION XHIS(XMONTH,XHOUR,XLATI)
1040. C CALCULATES THE SOLAR-ZENITH-ANGLE
1041. DAYNR=XMONTH*30.0-15.0
1042. SUNDEC=-0.40915*COS(1.7202E-2*(DAYNR+8.0))
1043. UMR=1.7453E-2
1044. COSXHI=SIN(XLATI*UMR)*SIN(SUNDEC) +COS(XLATI*UMR)*COS(SUNDEC)*
1045. 1COS(2.6180E-1*(XHOUR-12.0))
1046. XHIS=ACOS(COSXHI)/UMR
1047. RETURN
1048. END

1049. SUBROUTINE GGM(ART,XLG,BG,XLM,BM)
1050. C CALCULATES GEOMAGNETIC COORDINATES (XLM,BM) FROM GEOGRAFIC COORDINATES
1051. C (XLG,BG) FOR ART=0 AND REVERSE FOR ART=1
1052. INTEGER ART
1053. ZPI=6.2831853
1054. FAKTOR=0.0174533
1055. CBG=11.4*FAKTOR
1056. CI=COS(CBG)
1057. SI=SIN(CBG)
1058. IF(ART.EQ.0) GOTO 10
1059. CBM=COS(BM*FAKTOR)
1060. SBM=SIN(BM*FAKTOR)
1061. CLM=COS(XLM*FAKTOR)
1062. SLM=SIN(XLM*FAKTOR)
1063. SBG=SBM*CI-CBM*CLM*SI
1064. BG=ASIN(SBG)
1065. CBG=COS(BG)
1066. SLG=(CBM*SLM)/CBG
1067. CLG=(SBM*SI+CBM*CLM*CI)/CBG
1068. XLG=ACOS(CLG)
1069. IF(SLG.LT.0.0) XLG=ZPI-ACOS(CLG)
1070. BG=BG/FAKTOR
1071. XLG=XLG/FAKTOR
1072. XLG=XLG-69.8
1073. IF(XLG.LT.0.0) XLG=XLG+360.0
1074. GOTO 20
1075. 10 YLG=XLG+69.8
1076. CBG=COS(BG*FAKTOR)
1077. SBG=SIN(BG*FAKTOR)
1078. CLG=COS(YLG*FAKTOR)
1079. SLG=SIN(YLG*FAKTOR)
1080. SBM=SBG*CI+CBG*CLG*SI
1081. BM=ASIN(SBM)
1082. CBM=COS(BM)
1083. SLM=(CBG*SLG)/CBM

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1084.      CLM=(-SBG*SI+CBG*CLG*CI)/CBM
1085.      XLM=ACOS(CLM)
1086.      IF(SLM.LT.0.0) XLM=ZPI-ACOS(CLM)
1087.      BM=BM/FAKTOR
1088.      XLM=XLM/FAKTOR
1089. 20    RETURN
1090.      END

1091.      REAL FUNCTION SSRSU(H0)
1092.      REAL LATI,MONTH
1093.      COMMON/BL011/MONTH,LATI
1094.      SSRSU=XHIS(MONTH,H0,LATI)
1095.      RETURN
1096.      END

1097.      SUBROUTINE KOEFFB(FIELD)
1098. C      TRANSFORMATION COEFFICIENTS G(10144) VALID FOR 1973 FOR CALCULATING
1099. C      THE MAGNETIC FIELD ACCORDING TO POGO 68/10
1100.      DIMENSION FIELD (144)
1101.      REAL FELD (144)
1102.      DATA (FELD(KK),KK=1,80)/0.0, 0.1506723,0.0101742, -0.0286519, 0.00 . 9
1103.      12606, -0.0130846, 0.0089594, -0.0136808,-0.0001508, -0.0093977,
1104.      2 0.0130650, 0.0020520, -0.0121956, -0.0023451, -0.0208555,
1105.      3 0.0068416,-0.0142659, -0.0093322, -0.0021364, -0.0078910,
1106.      4 0.0045586, 0.0128904, -0.0002951, -0.0237245,0.0289493,
1107.      5 0.0074605, -0.0105741, -0.0005116, -0.0105732, -0.0058542,
1108.      60.0033268, 0.0078164,0.0211234, 0.0099309, 0.0362792, -0.0201070,
1109.      7 -0.0046350, -0.0058722, 0.0011147, -0.0013949,
1110.      8 -0.0108838, 0.0322263, -0.0147390, 0.0031247, 0.0111986,
1111.      9 -0.0109394,0.0058112, 0.2739046, -0.0155682, -0.0253272,
1112.      1 0.0163782, 0.0205730, 0.0022081, 0.0112749,-0.0098427,
1113.      2 0.0072705, 0.0195189, -0.0081132, -0.0071889, -0.0579970,
1114.      3 -0.0856642, 0.1884260,-0.7391512, 0.1210288, -0.0241888,
1115.      4 -0.0052464, -0.0096312, -0.0044834, 0.0201764, 0.0258343,
1116.      50.0083033, 0.0077187,0.0586055,0.0102236, -0.0396107,
1117.      6 -0.0167860, -0.2019911, -0.5810815,0.0379916, 3.7508268/
1118.      DATA (FELD(KZ),KZ=81,144)/1.8133030,
1119.      7 -0.0564250, -0.0557352, 0.1335347, -0.0142641,
1120.      8 -0.1024618,0.0970994, -0.0751830,-0.1274948, 0.0402073,
1121.      9 0.0386290, 0.1883088, 0.1838960, -0.7848989,0.7591817,
1122.      1 -0.9302389,-0.8560960, 0.6633250, -4.6363869, -13.2599277,
1123.      2 0.1002136, 0.0855714,-0.0991981, -0.0765378,-0.0455264,
1124.      3 0.1169326, -0.2604067, 0.1800076, -0.2223685, -0.6347679,
1125.      40.5334222, -0.3459502,-0.1573697, 0.8589464, 1.7815990,
1126.      5-6.3347645, -3.1513653, -9.9927750,13.3327637, -35.4897308,
1127.      637.3466339, -0.5257398, 0.0571474, -0.5421217, 0.2404770,
1128.      7 -0.1747774,-0.3433644, 0.4829708,0.3935944, 0.4885033,
1129.      8 0.8488121, -0.7640999, -1.8884945, 3.2930784,-7.3497229,
1130.      9 0.1672821,-0.2306652, 10.5782146, 12.6031065, 8.6579742,
1131.      1 215.5209961, -27.1419220,22.3405762,1108.6394043/
1132.      K=0
1133.      DO 10 I=1,144
1134.      K=K+1
1135. 10    FIELD(K)=FELD(I)
1136.      RETURN
1137.      END

1138.      SUBROUTINE FIELDG(DLAT,DLONG,ALT,X,Y,Z,F,DIP,SMODIP)
1139. C      THIS IS A SPECIAL VERSION OF THE POGO68/107
1140. C      MAGNETIC FIELD LEGENDRE MODEL (IN GAUSS UNITS).
1141. C      F IS TOTAL FIELD, Z THE (DOWNWARD) VERTICAL COMPONENT WHILE
1142. C      X AND Y ARE COMPONENTS IN THE EQUATORIAL PLANE X TO ZERO LONGITUDE).
1143. C      DIP=INCLINATION ANGLE/DEGREE. MODIP=RAWER'S MODIFIED DIP.
1144. C      REFERENCE@ METEOROLOGICAL AND ASTRONOMICAL INFLUENCES ON
1145. C      RADIO WAVE PROPAGATION. PERGAMON PRESS, 1963
1146. C      INPUT@ DLAT, DLONG=GEOGRAPHIC COORDINATES/DEGREE, ALT=ALTITUDE/KM.
1147. C      THE SET OF COEFFICIENTS IS GIVEN IN THE FOLLOWING PROCEDURE?
1148. C      DIMENSION H(144),XI(3)
1149. C      COMMON/BLOCK2/B0,B1,C1,HZ,T,G(144),HST,STR
1150. C      RLAT=DLAT*0.0174533
1151. C      CT=SIN(RLAT)
1152. C      ST=COS(RLAT)
1153. C      NMAX=11

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1154.      D=SQRT(40680925.0-272336.0*CT*CT)
1155.      RLONG=DLONG*0.0174533
1156.      CP=COS(RLONG)
1157.      SP=SIN(RLONG)
1158.      ZZZ=(ALT+40408589.0/D)*CT/6371.2
1159.      RHO=(ALT+40680925.0/D)*ST/6371.2
1160.      XXX=RHO*CP
1161.      YYY=RHO*SP
1162.      RQ=1.0/(XXX*XXX+YYY*YYY+ZZZ*ZZZ)
1163.      XI(1)=XXX*RQ
1164.      XI(2)=YYY*RQ
1165.      XI(3)=ZZZ*RQ
1166.      IHMAX=NMAX*NMAX+1
1167.      LAST=IHMAX+NMAX+NMAX
1168.      IMAX=NMAX+NMAX-1
1169.      DO 100 I=IHMAX,LAST
1170.      100 H(I)=G(I)
1171.      DO 200 K=1,3,2
1172.      I=IMAX
1173.      IH=IHMAX
1174.      300 IL=IH-I
1175.      F1=2.0/FLOAT(I-K+2)
1176.      X1=XI(1)*F1
1177.      Y1=XI(2)*F1
1178.      Z1=XI(3)*(F1+F1)
1179.      I=I-2
1180.      IF((I-1).LT.0) GOTO 400
1181.      IF((I-1).EQ.0) GOTO 500
1182.      DO 600 M=3,I,2
1183.      H(IL+M+1)=G(IL+M+1)+Z1*H(IH+M+1)+X1*(H(IH+M+3)-H(IH+M-1))-Y1*
1184.      1*(H(IH+M+2)+H(IH+M-2))
1185.      H(IL+M)=G(IL+M)+Z1*H(IH+M)+X1*(H(IH+M+2)-H(IH+M-2))+Y1*(H(IH+
1186.      1M+3)+H(IH+M-1))
1187.      600 CONTINUE
1188.      500 H(IL+2)=G(IL+2)+Z1*H(IH+2)+X1*H(IH+4)-Y1*(H(IH+3)+H(IH))
1189.      H(IL+1)=G(IL+1)+Z1*H(IH+1)+Y1*H(IH+4)+X1*(H(IH+3)-H(IH))
1190.      400 H(IL)=G(IL)+Z1*H(IH)+2.0*(X1*H(IH+1)+Y1*H(IH+2))
1191.      700 IH=IL
1192.      IF(I.GE.K) GOTO 300
1193.      200 CONTINUE
1194.      S=0.5*H(1)+2.0*(H(2)*XI(3)+H(3)*XI(1)+H(4)*XI(2))
1195.      XT=(R0+RQ)*SQRT(RQ)
1196.      X=XT*(H(3)-S*XXX)
1197.      Y=XT*(H(4)-S*YYY)
1198.      Z=XT*(H(2)-S*ZZZ)
1199.      F=SQRT(X*X+Y*Y+Z*Z)
1200.      Z=-Z*CT-(Y*SP+X*CP)*ST
1201.      DIP=ASIN(Z/F)
1202.      SMODIP=ASIN(DIP/SQRT(DIP*DIP+ST))
1203.      DIP=DIP*57.2957795
1204.      9 SMODIP=SMODIP*57.2957795
1205.      RETURN
1206.      END

1207.      SUBROUTINE F2OUT(XMODIP,XLATI,XLONGI,XMAGBR,R,XMONTH,HOUR,FOE,
1208.      1XHMF2,FOF2)
1209.      C D.BILITZA,20.8.78,CALCULATES XHMF2 AND NMF2 BY USING THE
1210.      C CCIR-MAPS FOR FOF2 AND M3000.YOU HAVE TO ADJUST THE TAPE
1211.      C READING PROCEDURE CCIRCA TO YOUR COMPUTER SYSTEM AND CCIR-TAPE
1212.      INTEGER QF(9),QM(7)
1213.      DIMENSION FFO(988)
1214.      REAL MMO(441)
1215.      DATA QF/11,11,8,4,1,0,0,0,0/,QM/6,7,5,2,1,0,0/
1216.      REWIND 15
1217.      LMONTH=IFIX(XMONTH)
1218.      CALL CCIRCA(R,LMONTH,FFO,MMO)
1219.      FOF2=GAMMA1(XMODIP,XLATI,XLONGI,.FALSE.,HOUR,6,QF,9,76,13,988,
1220.      1FFO)
1221.      XM3000=GAMMA1(XMODIP,XLATI,XLONGI,.FALSE.,HOUR,4,QM,7,49,9,441,
1222.      1MMO)
1223.      XHMF2=HMF2ED(XMAGBR,R,FOF2/FOE,XM3000)
1224.      RETURN
1225.      END

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1226.      REAL FUNCTION GAMMA1(SMODIP,SLAT,SLONG,UT,XHOUR,IHARM,NQ,K1,M,
1227.      1MM,M3,SFE)
1228.      C      SHEIKH,4.3.77,CALCULATES FOF2 OR M3000 USING CCIR
1229.      C      NUMERICAL MAP COEFFICIENTS SFE(M,2*IHARM+1).
1230.      C      NQ(K1) IS AN INTEGER ARRAY GIVING NQ1,NQ2,NQ3,...AS HIGHEST
1231.      C      DEGREE OF LATITUDE FOR EACH LONGITUDE HARMONIC (IHARM).
1232.      C      M=1+NQ1+2(NQ2+1)+2(NQ3+1)+... .IF UT IS TRUE,THEN HOUR IS
1233.      C      TAKEN AS UNIVERSAL TIME,OTHERWISE IT IS ASSUMED AS LOCAL
1234.      C      TIME.
1235.      DIMENSION NQ(K1),XSINX(13),COEF(100),C(12),S(12),SFE(M3)
1236.      LOGICAL UT
1237.      RD=57.2957795
1238.      IF(UT) GOTO 100
1239.      TIME=(15.0*XHOUR-180.0-SLONG)/RD
1240.      GOTO 150
1241. 100  TIME=(15.0*XHOUR-180.0)/RD
1242. 150  S(1)=SIN(TIME)
1243.      C(1)=COS(TIME)
1244.      DO 250 I=2,IHARM
1245.      C(I)=C(1)*C(I-1)-S(1)*S(I-1)
1246.      S(I)=C(1)*S(I-1)+S(1)*C(I-1)
1247. 250  CONTINUE
1248.      DO 300 I=1,M
1249.      COEF(I)=SFE((I-1)*MM+1)
1250.      DO 300 J=1,IHARM
1251.      COEF(I)=COEF(I)+SFE((I-1)*MM+2*J)*S(J)+SFE((I-1)*MM+2*J+1)*C(J)
1252. 300  CONTINUE
1253.      SUM=COEF(1)
1254.      SS=SIN(SMODIP/RD)
1255.      S3=SS
1256.      XSINX(1)=1.0
1257.      INDEX=NQ(1)
1258.      DO 350 J=1,INDEX
1259.      SUM=SUM+COEF(1+J)*SS
1260.      XSINX(J+1)=SS
1261.      SS=SS*S3
1262. 350  CONTINUE
1263.      XSINX(NQ(1)+2)=SS*S3
1264.      NP=NQ(1)+1
1265.      SS=COS(SLAT/RD)
1266.      S3=SS
1267.      DO 400 J=2,K1
1268.      S0=SLONG*FLOAT(J-1)/RD
1269.      S1=COS(S0)
1270.      S2=SIN(S0)
1271.      INDEX=NQ(J)+1
1272.      DO 450 L=1,INDEX
1273.      NP=NP+1
1274.      SUM=SUM+COEF(NP)*XSINX(L)*SS*S1
1275.      NP=NP+1
1276.      SUM=SUM+COEF(NP)*XSINX(L)*SS*S2
1277. 450  CONTINUE
1278.      SS=SS*S3
1279. 400  CONTINUE
1280.      GAMMA1=SUM
1281.      RETURN
1282.      END

1283.      SUBROUTINE CCIRCA(R,IMONTH,FOF2,SM3000)
1284.      C      THIS SUBROUTINE CALCULATES THE COEFFICIENTS ARRAYS FOF2(76,13) AND
1285.      C      SM3000(49,9) FOR SOLARACTIVITY (R) AND MONTH USING OUR SPECIAL CCIRFO-TAPE
1286.      C      DIMENSION FOF2(988),SM3000(441),F2(13,76,2),FM3(9,49,2)
1287.      DO 10 I=1,IMONTH
1288.      READ(15,1)
1289.      1  FORMAT( )
1290.      READ(15,2) ((F2(L,M,1),M=1,76),L=1,13)
1291.      READ(15,1)
1292.      READ(15,2) ((F2(L,M,2),M=1,76),L=1,13)
1293.      READ(15,1)
1294.      READ(15,2) ((FM3(L,M,1),M=1,49),L=1,9)
1295.      READ(15,1)
1296.      READ(15,2) ((FM3(L,M,2),M=1,49),L=1,9)
1297.      2  FORMAT(4(5X,E13.7))
1298.      10 CONTINUE
1299.      DO 20 I=1,76

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```

1300.      DO 20 J=1,13
1301.      K=J+13*(I-1)
1302. 20   FOF2(K)=(F2(J,I,1)*(100.0-R)+F2(J,I,2)*R)/100.0
1303.      DO 30 I=1,49
1304.      DO 30 J=1,9
1305.      K=J+9*(I-1)
1306. 30   SM3000(K)=(FM3(J,I,1)*(100.0-R)+FM3(J,I,2)*R)/100.0
1307.      RETURN
1308.      END

1309.      SUBROUTINE KOEFFI(BOF)
1310.  C COEFFICIENTS FOR BOTTOMSIDE F2 REGION ELECTRON DENSITY
1311.      DIMENSION BOF(2,2,8)
1312.      REAL FELD(32)
1313.      DATA FELD/114.0,64.0,134.0,77.0,128.0,66.0,75.0,73.0,113.0,115.0,
1314.      1150.0,116.0,138.0,123.0,94.0,132.0,72.0,84.0,83.0,89.0,75.0,85.0,
1315.      257.0,76.0,102.0,100.0,120.0,110.0,107.0,103.0,76.0,86.0/
1316.      L=0
1317.      K=0
1318.      DO 10 I=1,2
1319.      DO 10 J=1,2
1320.      DO 10 K=1,8
1321.      L=L+1
1322. 10   BOF(I,J,K)=FELD(L)
1323.      RETURN
1324.      END

1325.      SUBROUTINE KOEFP1(PG10)
1326.  C COEFFICIENTS PG10 FOR CALCULATING O+ PROFILES
1327.      DIMENSION PG10(80)
1328.      REAL FELD(80)
1329.      DATA FELD/-11.0,-11.0,4.0,-11.0,0.0,0.08018,
1330.      60.13027,0.04216,0.25 , -0.00686,0.00999,
1331.      15.113,0.1 ,170.0,180.0,0.1175,0.15,-11.0,
1332.      71.0 ,2.0,-11.0,0.069,0.161,0.254,0.18,0.0161,
1333.      20.0216,0.03014,0.1,152.0,167.0,0.04916,
1334.      80.17,-11.0,2.0,2.0,-11.0,0.072,0.092,0.014,0.21,
1335.      30.01389,0.03863,0.05762,0.12,165.0,168.0,0.008,
1336.      90.258,-11.0,1.0,3.0,-11.0,0.091,0.088,
1337.      40.008,0.34,0.0067,0.0195,0.04,0.1,158.0,172.0,
1338.      10.01,0.24,-11.0,2.0,3.0, -11.0,0.083,0.102,
1339.      50.045,0.03,0.00127,0.01,0.05,0.09,167.0,185.0,
1340.      20.015,0.18/
1341.      K=0
1342.      DO 10 I=1,80
1343.      K=K+1
1344. 10   PG10(K)=FELD(I)
1345.      RETURN
1346.      END

1347.      SUBROUTINE KOEFP2(PG20)
1348.  C COEFFICIENTS FOR CALCULATING O+ PROFILES ABOVE ITS PEAK
1349.      DIMENSION PG20(32)
1350.      REAL FELD(32)
1351.      DATA FELD/1.0,-11.0,-11.0,1.0,695.0, -.000781,
1352.      3-.00264,2177.0,1.0,-11.0,-11.0,2.0,570.0,
1353.      1-.002,-.0052,1040.0,2.0,-11.0,-11.0,1.0,695.0,
1354.      4-.000786, -.00165,3367.0,2.0,-11.0,-11.0,2.0,
1355.      2575.0, -.00126,-.00524,1380.0/
1356.      K=0
1357.      DO 10 I=1,32
1358.      K=K+1
1359. 10   PG20(K)=FELD(I)
1360.      RETURN
1361.      END

1362.      SUBROUTINE KOEFP3(PG30)
1363.  C COEFFICIENTS FOR CALCULATING O2+ PROFILES
1364.      DIMENSION PG30(80)
1365.      REAL FELD(80)
1366.      DATA FELD/-11.0,1.0,2.0,-11.0,160.0,31.0,130.0,
1367.      9-10.0,198.0,0.0,0.05922,-0.07983,

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1368.      1-0.00397,0.00085,-0.00313,0.0,-11.0,2.0,2.0,-11.0,
1369.      8140.0,30.0,130.0,-10.0,
1370.      2190.0,0.0,0.05107,-0.07964,0.00097,-0.01118,-0.02614,
1371.      7-0.09537,
1372.      3-11.0,1.0,3.0,-11.0,140.0,37.0,125.0,0.0,182.0,
1373.      60.0,0.0307,-0.04968,-0.00248,
1374.      4-0.02451,-0.00313,0.0,-11.0,2.0,3.0,-11.0,
1375.      5140.0,37.0,125.0,0.0,170.0,0.0,
1376.      50.02806,-0.04716,0.00066,-0.02763,-0.02247,-0.01919,
1377.      6-11.0,-11.0,4.0,-11.0,140.0,45.0,136.0,-9.0,
1378.      7181.0,-26.0,0.02994,-0.04879,
1379.      7-0.01396,0.00089,-0.09929,0.05589/
1380.      K=0
1381.      DO 10 I=1,80
1382.      K=K+1
1383.      10 PG30(K)=FELD(I)
1384.      RETURN
1385.      END

1386.      SUBROUTINE SUFE (FIELD,RFE,M,FE)
1387.      C SPECIAL SUBROUTINE FOR CHOOSING THE DESIRED
1388.      C ION DENSITY PARAMETER ARRAYS
1389.      DIMENSION RFE(4),FE(12),FIELD(80),EFE(4)
1390.      K=0
1391.      100 DO 101 I=1,4
1392.      K=K+1
1393.      101 EFE(I)=FIELD(K)
1394.      DO 111 I=1,M
1395.      K=K+1
1396.      111 FE(I)=FIELD(K)
1397.      DO 120 I=1,4
1398.      IF((EFE(I).GT.-10.0).AND.(RFE(I).NE.EFE(I))) GOTO 100
1399.      120 CONTINUE
1400.      RETURN
1401.      END

1402.      FUNCTION HPOL(XHOUR,TW,XNW,SA,SU)
1403.      C D.BILITZA,1978 SPECIAL PROCEDURE FOR TIME-INTERPOLATION
1404.      C USING EPSTEIN STEP FUNCTION OF ONE HOUR WIDTH (DAY/NIGHT FUNCTION).
1405.      C TW,XNW ARE THE DAY AND NIGHT VALUE OF THE PARAMETER.
1406.      C SA, SU ARE TIME (HOURS) OF SUNRISE AND SUNSET/HOUR.
1407.      C IF(ABS(SU-SA).GE.24.0) GOTO 100
1408.      HPOL=XNW+(TW-XNW)/(1.0+EXP(-(XHOUR-SA)/1.0))+(XNW-TW)
1409.      //(1.0+EXP(-(XHOUR-SU)/1.0))
1410.      GOTO 200
1411.      100 HPOL=XNW
1412.      IF(SA.LT.1.0) HPOL=TW
1413.      200 RETURN
1414.      END

1415.      REAL FUNCTION XPOL(AA,XHOUR,SA,SU,DELL,IMONTH,R)
1416.      C SPECIAL FUNCTION TO INTERPOLATE ARRAY AA(LATI,R,MONTH,HOUR)=
1417.      C A(2,2,4,2) IN LATITUDE (LATI), SOLAR ACTIVITY (R) AND TIME (HOUR)
1418.      DIMENSION AA(2,2,8),SIPH(2),SIPL(2)
1419.      JMONTH=IMONTH*2
1420.      DO 10 ISR=1,2
1421.      DO 15 ISLAT=1,2
1422.      15 SIPH(ISLAT)=HPOL(XHOUR,AA(ISLAT,ISR,JMONTH-1),AA(ISLAT,ISR,
1423.      1JMONTH),SA,SU)
1424.      SIPL(ISR)=SIPH(1)+(SIPH(2)-SIPH(1))/DELL
1425.      10 CONTINUE
1426.      XPOL=SIPL(1)+(SIPL(2)-SIPL(1))/90.0*(R-10.0)
1427.      RETURN
1428.      END

1429.      FUNCTION EPSTEP(BE,AB,TH,FIX,COSI)
1430.      C EPSTEIN STEP FUNCTION = TRANSITION WITH THICKNESS TH BETWEEN
1431.      C BE AND AB CENTERED WHERE VARIABLE COSI EQUALS FIX
1432.      EPSTEP=AB+(BE-AB)/(1.0+EXP(-(COSI-FIX)/TH))
1433.      RETURN
1434.      END

```

5.1 Subroutine IONDEM

Subroutine IONDEM from IRI 1978, not available from WDC-A for STP.

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SUBROUTINE IONDEM(R,XMLAT,XMLONG,DIP,XLATI,HOUR,XMONTH,FOF2,HMF2)
C   SHEIKH,BILITZA, 25.8.78,CALCULATES THE HEIGHT AND DENSITY OF THE
C   F2-MAXIMUM BY USING THE CHING-CHIU-MODEL
C   [REF. CHIU,JATP,37, 1963-1970, 1975 AND PRIVATE COMMUNICATION]
C   TM0=XMONTH
C   TM0=0.0
C   IF(XMONTH.GT.11.0) TM0=0.0
C   PH1=0.2618*HOUR
C   RLATH=XMLAT*0.017453295
C   RLAT=XLAT*0.017453295
C   RLONGH=XMLH*0.017453295
C   DIPGM=DIP*0.017453295
C   AMP=0.66
C   ALF=1.0
C   PI=3.141592654
C   SDEC=0.39795*SIN(PI*(TH0-3.167)/6.0)
C   DEC=ARSIN(SDEC)
C   DELP=AUS(ABS(RLAT)-PI/2.0)
C   IF(DELP.GT.1.0E-3) GOTO 100
C   SEASN=RLAT+DEC
C   IF(SEASN.LT.0.0) PHI=0.0
C   IF(SEASN.GE.0.0) PHI=PI
C   100 VAR=TVARF2(RLATM,RLONGH,DIPGM,PHI,DEC,TH0,R)
C   ZALF=-4.5*ABS(RLATM)-PI
C   ZBAR=240.0*0.75*R+0.83*R*COS(RLATM)*SIN(DEC)*SIN(RLATM)
C   ZMAX=ZBAR+30.0*COS(PHI+ZALF)+10.0*COS(RLATM)*
C   1COS(PI*(TM0-4.5)/3.0)
C   HMF2=MACH CHIU 1975
C   HMAX=0.2*ZMAX+0.0
C   HMF2=ZMAX
C   FOF2=SQRT(AMP*VAR/0.124)
C   RETURN
C   END
C   FUNCTION TVARF2(RLATM,RLONGH,DIPGM,PHI,DEC,TH0,R)
C   PI=3.141592654
C   PI3=PI/3.0
C   SINLM=SIN(RLATM)
C   RT3=-COS(PI3*TM0)+COS(PI3*TM0/2.0)
C   RR=0.01*R
C   ALAT=ABS(RLATM)
C   AQ=COS(RLATM)
C   REQ=1.0-0.2*RR+0.6*SQRT(RR)
C   SD=SIN(DEC)*SIN(RLATM)
C   FF=EXP(-ABS(X)**6.0)
C   GG=1.0-FF
C   CP1=COS(PHI=0.873)
C   EF=COS(PHI+PI/4.0)
C   EMF=EF*EF
C   ADIUR=(0.5+0.32*SD)*(1.0+SD*EMF)
C   BQ=COS(ALAT=0.2618)
C   AQE=ARS(AQ)**8.0
C   AQT=AQE*AQ*AQ
C   AEQ=AQE*REQ*EXP(0.25*(1.0-CPD))
C   VEQ=(1.0-0.4*AQT)*(1.0-AEQ*ABS(BQ)**12.0)*
C   1(1.025+0.05*RT3)*(1.0+0.6*AQT*EMF)
C   VDIUR=ADIUR*EXP(-1.1*(CPD+1.0))
C   VLAT=EXP(3.0*COS(RLATM*(SIN(PHI)-1.0)/2.0))
C   VLAT=VLAT*(1.2-0.5*AQ*AQ)
C   RT1=12.0*PLATH+4.0*PI3
C   RT2=TH0/2.0-3.0
C   VLAT=VLAT*(1.0+0.05*RR*SINLM*SINLM*SINLM*COS(PI3*TH0/2.0))*_
C   1(1.0-0.15*EXP(-SQRT(RT1*RT1+RT2*RT2)))
C   RFUNC=1.0+R+0.204*RR*RR+0.03*RR*RR*RR
C   IF(RR.LE.1.1) GOTO 100
C   CQ=1.53*(1.0-AQ*AQ)
C   RFUNC=2.39+CQ*(RFUNC-2.39)
C   VUT=YONII(RLATM,PHI,TH0,DEC,R,RFUNC)
C   XXLONG=1.0+0.1*AQ*AQ*AQ*COS(2.0*(RLONGH-7.0*PI/18.0))
C   GM1=1.015+0.03*RT3
C   SINLM2=SIN(RLATM/2.0)
C   XML=ABS(DIPGM)-2.0*PI/9.0
C   G=0.15-(1.0+RR)*SINLM2*SINLM2*EXP(-0.33*(TH0-6.0)
C   1*(TM0-6.0))
C   DDEL3=GM1*(1.0+G*EXP(-18.0*XML*XML))
C
C   CORRECTED ACCORDING TO THE PROGRAM RECEIVED FROM CHIU
C
C   RT1=PI*TH0/12.0
C   RT2=SIN(RT1)
C   RT3=COS(2.0*RT1)
C   DEL3=SIN(RLONGH/2.0)
C   G=COS(RLONGH/2.0-PI/20.0)
C   GM1=ABS(G)**4.0
C   SINLM=SIN(RLONGH)
C   SINLM2=SQRT(ABS(SINLM))
C   XML=DEC
C   DEC=-23.5*PI/180.0
C   IF(RLATM.GE.0.0) GOTO 200
C   XLONGH=RT2*(0.5*DEL3-0.5*SINLM-ABS(DEL3)
C   1*#8.0)-(1.0+RT2)*RT3*SINLM/SINLM2*EXP(-4.0*DEL3*DEL3)
C   POLER=2.5+2.0*RR+RT3*(0.5*(1.3+0.2*RR)*GM1)+(1.3+0.5
C   1*RR)*COS(PHI-PI*(1.0+XLONGH))
C   POLER=POLER*(1.0+0.4*(1.0-RT2*RT2)*EXP(-GM1*RT2))
C   GOTO 300
C   200 POLER=(2.0+1.2*RR)*W(1.2*RLATHM,PHI, DEC)*(1.0+0.3*RT2)
C   300 DEC=XHL
C   F2=VDIUR*VLAT*VUT*VEQ*RFUNC**XXLONG*DDEL3
C   TVARF2=FF*POLER+GG*F2
C   RETURN
C   END

```

```

FUNCTION YONJI(RLATM,PHI,TMO,DEC,R,RFUNC)
P=3.141592654
B=1.340139*((R/100.0)**2.0)*(1.0+COS(RLATM-PI/4.0))
1+0.0517*((R/100.0)**3.0)
D13=1.0/RFUNC
W1=PI/6.0
W2=W1+W1
DE=0.1778*((R/100.0)**2.0)
ALAT=ABS(RLATM)
SNX=SIN(ALAT-0.5235988)
AE=0.2*(1.0-SNX)
BLAT=ABS(ALAT-PI/9.0)
SX=SIN(BLAT)
FE=0.13-0.06*SX
YAH=COS(RLATM+DEC)
CPHG=COS(PHI)
XTC=(SIGN(1.0,YAH)*ABS(YAH)**3.0)*((1.0-CPHG)**0.25)
YTC=(0.15-0.3*SIN(ALAT))*XTC
T1=AE*(1.0+0.6*COS(W2*(TMO-4.0)))*COS(W1*(TMO-1.0))
XXX=COS(P1*(TMO-2.0)/12.0)
XXXX=CUS(P1*(TMO-8.0)/12.0)
T2=0.7*(1.0+0.085*(CUS(RLATM-W1)*(SIGN(1.0,XXX)*ABS(XXX)**3.0)
1+CUS(RLATM+PI/4.0)*(ABS(XXXX)**2.0))+DE*COS(
2W2*(TMO-4.3))/RFUNC)*W(B,RLATM,PHI,DEC)
T3=FE*COS(W2*(TMO-4.5))+YTC
T4=(T1+T3)*D13+T2
IF(T4.LT.0.0) T4=0.0
YDN11=T4
RETURN
END

FUNCTION W(B,XI,ETAS,DEC)
P=XI+DEC*COS(ETAS)
W=EXP(-B*(CUS(P)-COS(XI)))
RETURN
END

```

Replace CALL F2OUT (MODIP, LATI, LONGI, MAGBR, R, MONTH, HOUR, FOE,
HMF2, FOF2)
by IONDEM (R, MLAT, MLONG, DIP, LATI, HOUR, MONTH, FOF2, HMF2)
at the beginning of the program part
' CALCULATION OF ELECTRON DENSITY PARAMETERS '

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